SERVICE MANUAL

AND

INSTRUCTIONS FOR CONTINUED AIRWORTHINESS

FOR

AEROCET 3400 AMPHIBIOUS SEAPLANE FLOATS

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This ICA must be followed when Aerocet 3400 Floats are installed in accordance with Supplemental Type Certificate (STC) No. SA01257SE.

The information contained in this document supplements or supercedes the basic manuals only in those areas listed herein. For limitations, procedures, and performance information not contained in this manual, consult the basic aircraft ICA or maintenance manual.

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Date: 2010.12.01 09:59:53 -08'00'

Log of Revisions Page

REV.	PAGES AFFECT.	DESCRIPTION	DATE
0	ALL	Initial Release	8/12/03
1	2, 15, 22-25	Calendar time added to inspection schedule, editorial.	9/25/04
2	27	Corrected tire ply from 6 to 8 ply rating	8/1/06
3		Incorporated changes to the lower nose gear assembly, keel and wear strip installation, main gear and edited troubleshooting in gear advisory/hydraulic pump.	3/17/08 TH
4	10 15-17 11, 13, 16, 17.	Added 35A-45700 Wheel Installation & references to A-10036 CMM. Added Ni8U-EM12E-AN6X2-H1141 Sensor to main gear section. Added Figures 5.2.10; 5.3; 5.6; 5.7a, 5.7b; .	7/06/09 TH
5	5, 59-68 7 8 9 11 12 12-15 17 23 32-34 38 40, 48 51 69	Added Section 11. Troubleshooting. Added note Re: K-66 compatibility. Added 1.1 Availability of this manual. Added 1.2 Applicable CMM's Added 1.3 Dimensions, Locations and Nomenclature. Deleted "UHMW Plastic" from Keel Strip description. Added Figure 2.1. Added "(for old style plugs only)" Added 2.1, 2.2, and 2.3 for Fasteners. Added Figure 3.1.1. 5.2.11 Expanded Axle Nut Installation. Added Figures 6.2.1, 6.2.2, 6.2.3, 6.2.4, & 6.2.5. Added Figure 6.7 to differentiate between old and new Gear Advisories. Added Note to define text applicable to only the K-65 Gear Advisories. Added 6.8 with illustrations for Spot Mirror. Added "removal" to Para. 2 & 3. Changed title of Section 9 from "Continued Airworthiness Schedule…" to "Recommended Airworthiness Schedule…" Added Section 12. Airworthiness Limitations to comply with 14 CFR Part 23, Appendix G.	8/17/09 T. Hamilton
6	43-52 7, 30-31 79-80	Added new section 8 on installation of floats to aircraft including weights of remaining components. Other changes to include 206 Added Appendix with Install drawings for CPL	8/27/2010 MHH

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1 Introduction and General Float Information

This service and maintenance manual is applicable to Aerocet Model 3400 Amphibious Seaplane Floats and their general application to a variety of airplanes. The Customer Parts List in the appendix provides pertinent data referenced to in the text of this manual. Strut geometry, boxing (flying) wires, specific hydraulic line routing, pump mounting – electric and emergency, specific wiring, water rudder retract routing, and landing gear advisory mounting are unique for each STC or TC application to aircraft. Installation of the Aerocet Model 3400 Amphibious Seaplane Floats should be done according to the FAA approved drawings supporting these different applications.

The Aerocet Model 3400 Amphibious Seaplane Floats are twin all composite float hulls separated by spreader bars, which incorporate hydraulically-operated retractable landing gear allowing for landing on either water or land. An airplane-mounted electric-hydraulic pump, with a backup hand pump operates the hydraulics. The float utilizes a double fluted bottom contour from the step forward and has a flat top deck design with built-in antiskid. Each float offers a single large storage locker. Each float has six compartments for safety. Access to the inside of these compartments is through screwed on access panels on the deck or through the storage locker hatch cover. Water rudders are mounted on the stern of each float for water taxi operations. The floats are mounted to various airplanes by aerodynamic aluminum struts. These are rigidly mounted. Boxing (flying) wires are used to stabilize the mounting of the floats to the airplane.

The floats incorporate pump locations into each compartment and these are used to remove any excess water through condensation, leakage from the access panel gaskets, bolts, or pump-out plugs, or leakage from a damaged float hull. These pump locations will also show hydraulic leakage, which is red in color.

The main landing gear utilizes a trailing arm link design using a 6.00 X 6 tire and a oleo shock strut. The nose gear is full swiveling, has a centering device, and uses a composite strut for absorbing the landing loads. Steering of the airplane is done through differential braking.

A panel mounted landing gear advisory and gear position switch is used. It includes an up and down lever, lights for each gear and their position, a pump operation light, and an audio output to advise the pilot of gear position when triggered at a set speed. An optional smaller, dash mounted, landing gear position light system is available giving the pilot more heads up awareness of the landing gear condition prior to landing.

> Note: The K-66 “auxiliary” unit is only available with the K-65 Gear Advisory, and is not useful or compatible with the newer, Model GC600 Gear Advisory units.

1.1 Availability

One complete hard (paper) copy of this manual shall be provided with each new set of Model 3400 Twin Amphibian Floats. Additional copies and minor revisions shall be available via email, U.S.P.S. (mail), UPS or FedEx by request. Fees and delivery charges may apply.

Notification of any changes that require service for airworthiness shall be distributed to all applicable Aerocet owners on record with Aerocet, Inc. In such a case, copies of the applicable, revised portions of this manual shall be provided.

Aerocet, Inc. maintains record of purchasers and/or owners, collected at the time of purchase in order to comply with the above, as well as to maintain a high standard of service. If you have moved since your original purchase, have purchased a used product or otherwise have reason to believe that the contact information on file is incorrect, please provide the following information to Aerocet, Inc: (Aerocet contact information is on the front of this document.)

Float Information:

Float Model: _____
Float S/N (R/L) _____

Aircraft Information:

Aircraft Make/Model _____
Aircraft Registration _____
Aircraft S/N _____

Owner Information: (as applicable)

Previous Owner _____
Previous Address _____
Present Owner _____
Present Address _____
Present Phone Number _____
Present Email Address _____

1.2 Component Maintenance Manuals

Certain accessories that are more complex, that require additional inspection and maintenance procedures are described in Component Maintenance Manuals (CMM) or Maintenance Manuals (MM). References to the necessary manuals are placed in relevant areas of this manual. Depending upon the optional equipment you have installed on your Aerocet Model 3400 floats, you may also require the following CMM's, MM's or Parts Catalogs:

1) Cleveland Wheels and Brakes, AWBCMM0001-7 (or later) Maintenance Manual.
2) Cleveland Wheels and Brakes, AWBPC0001-7 (or later) Product Catalog
3) Aerocet A-10036, Component Maintenance Manual [Aerocet 6.00-6 Wheel Assembly]
4) Aerocet A-10037, Component Maintenance Manual [Aerocet Model GC600 Gear Advisory]

1.3 Dimensions, Locations and Nomenclature

Figure 1.3.1 Showing Model 3400 Amphibious Float installation on a Cessna 180 Aircraft (185 similar). The Cessna 206 series has a tail height of 13’ 2”.

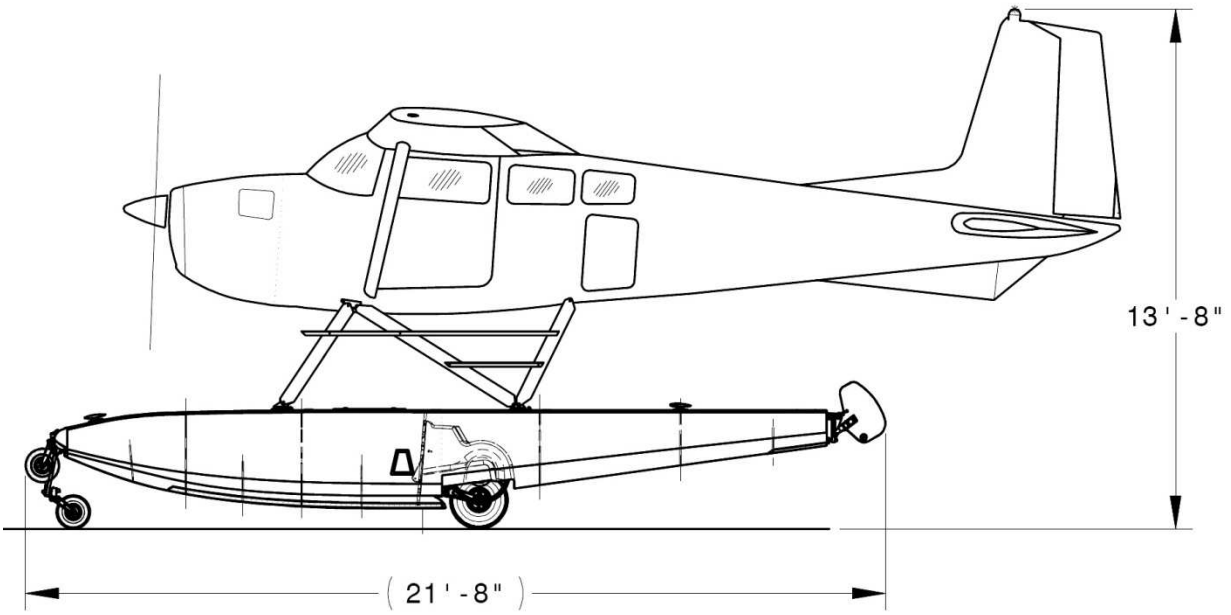


Figure 1.3.2 Showing Front View of Model 3400 Floats.

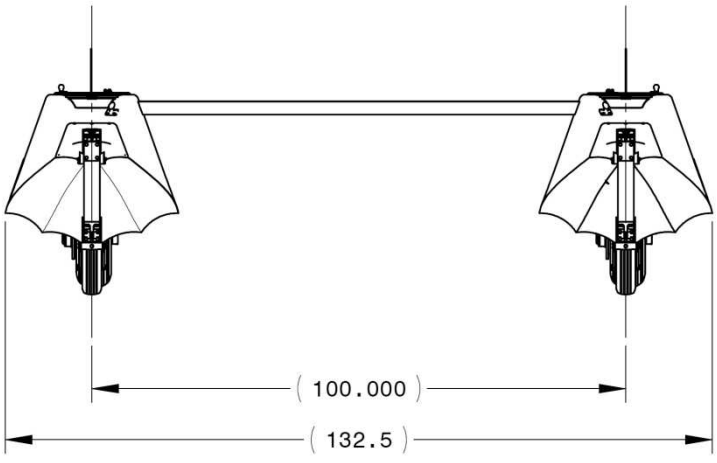


Figure 1.3.3

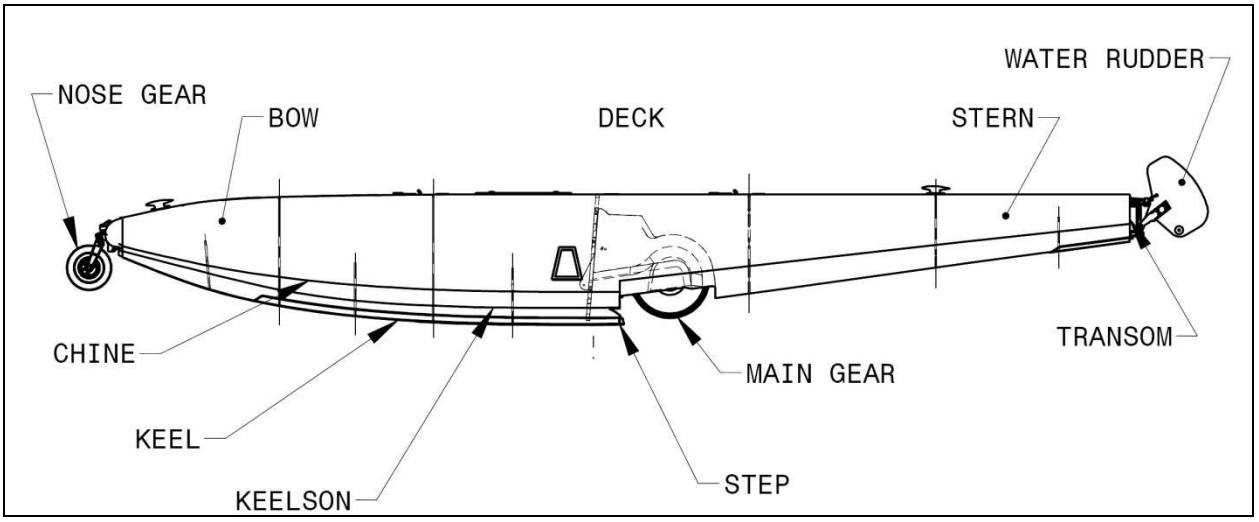
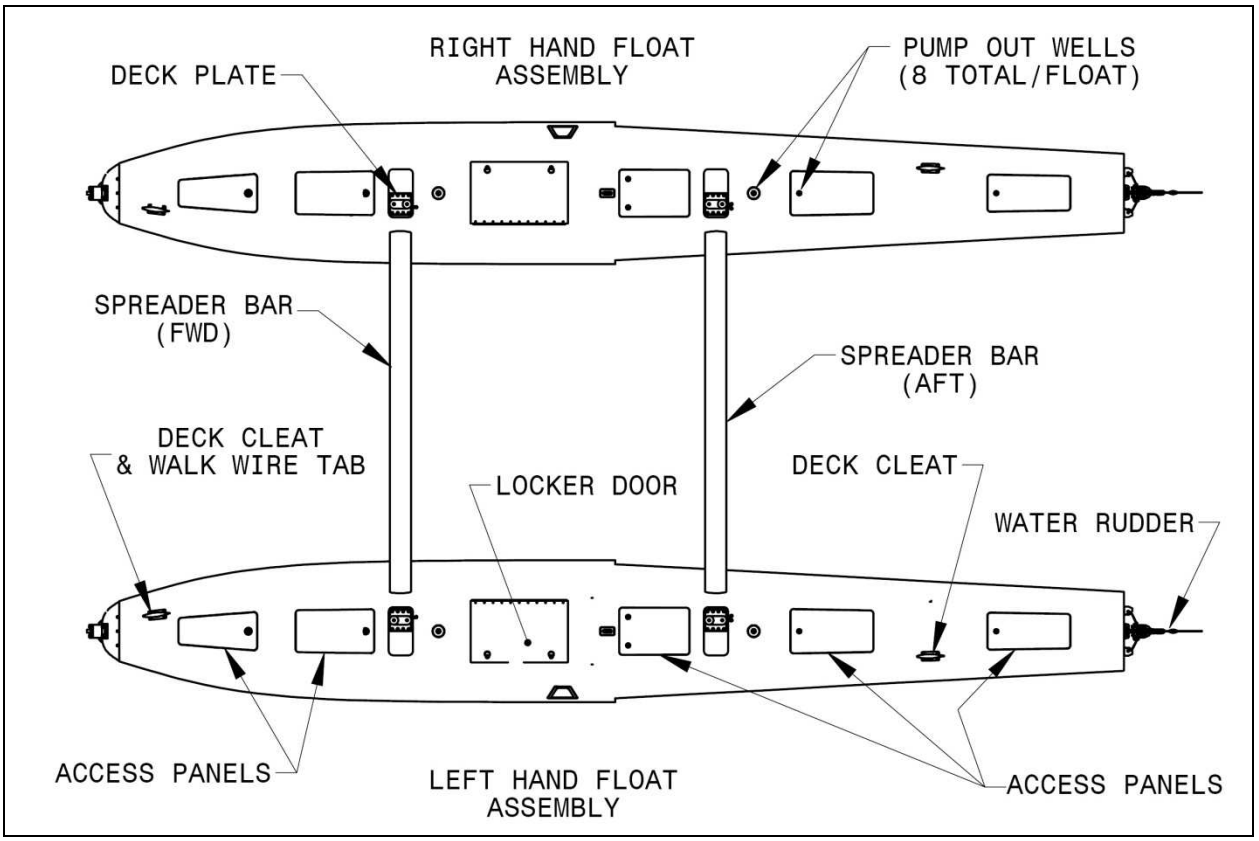


Figure 1.3.4



2 Float Hull Maintenance

Because of the composite structure in the design of the floats, hull corrosion and leakage are basically eliminated. The floats should be kept clean with soap and water. The sides and the bottoms from the step aft can be waxed to help in the cleaning process. The bottoms of the floats from the step forward should not be waxed as this gives unpredictable water performance. Stains from the waterline on down may be removed using marine fiberglass stain remover. We have used a product called FSR with good success. Do not use abrasive cleaners or pads – these will scratch the white gel-coat surface. The gel-coat color surface should always be maintained on the floats for ultraviolet protection.

The metal chine strips are abrasive wear surfaces used to protect the floats from docks and pilings. These are extrusions bonded on using a one-part urethane adhesive. These should be kept intact.

The keels have wear strips bonded on for protection and optional wear strips can be added up from the keel in the step area where the float would nest in the rocks on the beach. These wear strips should be observed on preflight when on land or if you suspect damage. They should never be allowed to wear through to the gel-coat surface on the float. Replace as necessary.

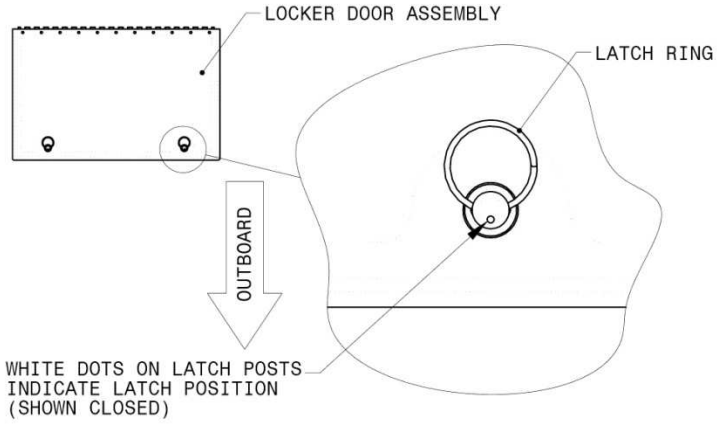
All float access panels are to be removed upon annual inspection to view for hidden damage and to comply with the hydraulic maintenance section and water rudder section. During this time assure that all the pump-out tubes are not cracked (especially around the fitting to the pump-out cup), that they pass through their respective locators to keep them in the low spots, and have no blockage. If a pump-out tube is cracked, it will not pull the water out of its respective compartment resulting in extra weight and CG problems. Replace as necessary.

Any penetration to the float structure, delamination of the layers of cloth, or gel-coat wearing through must be repaired according to hull repair section 8. Significant damage warrants consultation from Aerocet, Inc.

Winter storage, where temperatures may drop below freezing, is addressed by adding a quart of RV antifreeze through each of the pump-out cups. Taping over the pump-out holes will minimize the amount of moisture that will enter each of the six compartments. Do not use masking tape.

Float locker latches and seals are to be maintained as needed. The locker latches are adjusted by adding washers beneath the black catch ramp the correct distance to maintain an indent as the locker latches (the white dots to the outside).

Figure 2.1.



Investigation should be prompted if excessive water is pumped from any of the pump-out cups during operation. Water can leak through the pump-out plugs where the nylon pull line penetrates (older style plugs only) and may seep through the access panel seals. Condensation will also generate water inside the float compartments. More than 4 or 5 full pumps of water, using an aircraft float pump, should raise concern for maintenance. In contrast, if a pump-out tube is cracked or broken there will not be a significant sucking sound when the pump is removed from the pump-out cup. If there is question regarding the integrity of the pump-out tube, investigate. Attention should be given to any bolts that pass through the stern, nosebox and main gearbox area for leakage. These should be sealed into place using a single part urethane such as Sikaflex 292. It should also be noted that more water is typically pumped from the stern and bow compartments because they are often covered with water during operation and allow more seepage through the plugs and seals. Pump-out plugs must have some venting capability to allow for expansion and contraction of the air in each compartment during flight.

If the pilot, when on the water, runs over rocks or debris, assess the damage as soon as possible. Continuing into a high speed situation with the floats, will typically exaggerate the damage due to high water pressure. If the pilot makes a hard landing on the runway, stop and examine the landing gear parts and supporting structure for damage. The composite nose strut should not have any delamination, the main gear truck should not have any sheared rivets and all the metal should have no distortion. The drag brace (the metal part which connects the oleo strut to the step bulkhead) should not be bent (especially in the area of the over center stop contact point).

2.1 Fastener Torque

Torque Value Conversion:
To convert in.-lbs. to ft.-lbs: Value (ft.-lbs.) x 12 = Value (in-lbs.)
To convert ft.-lbs. to in.-lbs: Value (in-lbs.) x 0.0833 = Value (ft.-lbs.)

2.1.1 Tooling Requirements:

Calibrated torque wrench
Adapters that affect the length of the torque wrench will affect the required torque indication and must be calculated according to Figure 1.4.3.

2.1.2 Hardware Cleanliness:

All hardware is to be free of dirt, grit and grease. All dirty hardware shall be thoroughly cleaned and lubricated with a dry film lubricant such as LPS 1, or Teflon products per manufacturer instructions. It is recommended that all stainless hardware be thoroughly lubricated with anti-seize lubricant of good quality to prevent galling upon assembly.

2.1.3 Torque Procedure

Assure that hardware is clean and properly prepared for installation. Assemble nuts to bolts, measuring the tension required to turn the nut and add this to the required final torque. Where possible apply torque to the nut, and not to the fastener head. Apply a smooth, even pressure, stopping and re-torquing if chattering or premature loading occurs. This may warrant disassembly and subsequent inspection for burrs or galling. Replace any damaged hardware.

Access panels should be torqued only to "hand tight", the fiberglass should exhibit only mild deformation. A portable hand drill could be used, provided that the clutch is set properly. Do not apply more pressure to the hatch screws than is necessary to engage the tool to the fastener head as this will risk damaging the Tinnerman style nuts below.

All other nuts shall be torqued per Section 1.4 unless otherwise noted.

2.2 Fastener Torque Values

(Except where otherwise noted, such as Deck Fitting bolts – see installation drawings)

CAUTION
THE FOLLOWING TORQUE VALUES ARE DERIVED FROM OIL FREE CADMIUM PLATED THREADS.

	TORQUE LIMITS RECOMMENDED FOR INSTALLATION (BOLTS LOADED PRIMARILY IN SHEAR)		MAXIMUM ALLOWABLE TIGHTENING TORQUE LIMITS	
Thread Size	Tension type nuts MS20365 and AN310 (40,000 psi in bolts)	Shear type nuts MS20364 and AN320 (24,000 psi in bolts)	Nuts MS20365 and AN310 (90,000 psi in bolts)	Nuts MS20364 and AN320 (54,000 psi in bolts)
FINE THREAD SERIES				
8-36	12-15	7-9	20	12
10-32	20-25	12-15	40	25
1/4-28	50-70	30-40	100	60
5/16-24	100-140	60-85	225	140
3/8-24	160-190	95-110	390	240
7/16-20	450-500	270-300	840	500
1/2-20	480-690	290-410	1100	660
9/16-18	800-1000	480-600	1600	960
5/8-18	1100-1300	600-780	2400	1400
3/4-16	2300-2500	1300-1500	5000	3000
7/8-14	2500-3000	1500-1800	7000	4200
1-14	3700-5500	2200-3300*	10,000	6000
1-1/8-12	5000-7000	3000-4200*	15,000	9000
1-1/4-12	9000-11,000	5400-6600*	25,000	15,000

Figure 2.2.1 Recommended Torque Values (inch-pounds)
(From AC43.13-1B, Table 7-1)

FINE THREAD SERIES	
THREAD SIZE	**MINIMUM PREVAILING TORQUE**
7/16 - 20	8 inch-pounds
1/2 - 20	10 inch-pounds
9/16 - 18	13 inch-pounds
5/8 -18	18 inch-pounds
3/4 - 16	27 inch-pounds
7/8 - 14	40 inch-pounds
1 - 14	55 inch-pounds
1-1/8 - 12	73 inch-pounds
1-1/4 - 12	94 inch-pounds
COARSE THREAD SERIES	
THREAD SIZE	**MINIMUM PREVAILING TORQUE**
7/16 - 14	8 inch-pounds
1/2 - 13	10 inch-pounds
9/16 - 12	14 inch-pounds
5/8 - 11	20 inch-pounds
3/4 - 10	27 inch-pounds
7/8 - 9	40 inch-pounds
1 - 8	51 inch-pounds
1-1/8 - 8	68 inch-pounds
1-1/4 - 8	88 inch-pounds

Self-Locking Nuts:

Self-locking nuts, when re-used, must have at least the minimum prevailing torque listed in figure to the left. Nuts that are smaller than those listed in the table shall not be used if they can be run up by hand.

Figure 2.2.2 Minimum Prevailing Torque Values for Re-used Self-Locking Nuts
(from AC43.13-1B, Table 7-2)

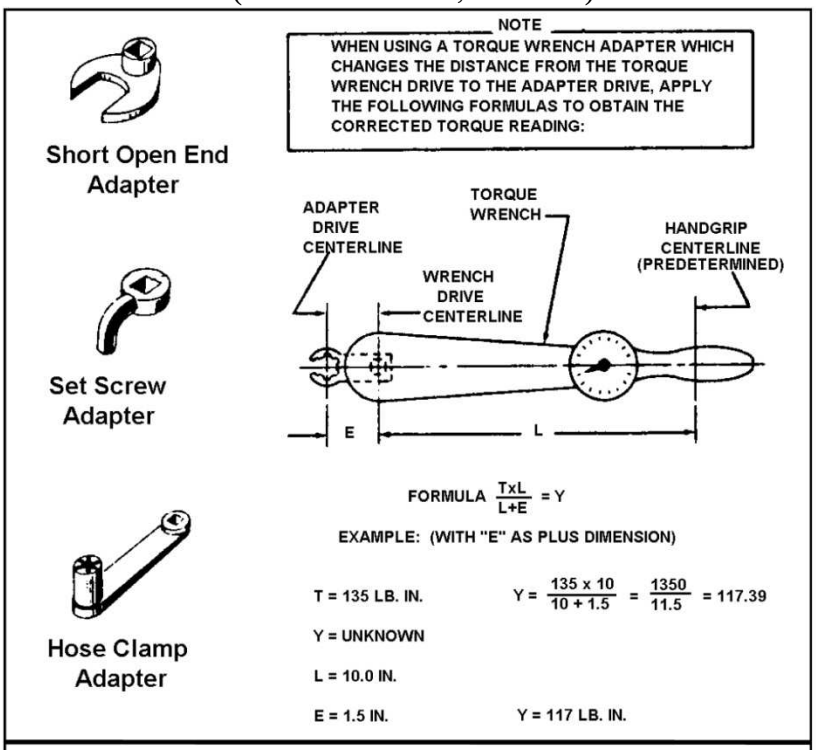

NOTE
WHEN USING A TORQUE WRENCH ADAPTER WHICH CHANGES THE DISTANCE FROM THE TORQUE WRENCH DRIVE TO THE ADAPTER DRIVE, APPLY THE FOLLOWING FORMULAS TO OBTAIN THE CORRECTED TORQUE READING:
Short Open End Adapter
Set Screw Adapter
Hose Clamp Adapter
ADAPTER DRIVE CENTERLINE
TORQUE WRENCH
HANDGRIP CENTERLINE (PREDETERMINED)
WRENCH DRIVE CENTERLINE
E
L
FORMULA TxL / L+E = Y
EXAMPLE: (WITH "E" AS PLUS DIMENSION)
T = 135 LB. IN.
Y = UNKNOWN
L = 10.0 IN.
E = 1.5 IN.
Y = 135 x 10 / 10 + 1.5 = 1350 / 11.5 = 117.39
Y = 117 LB. IN.
LEGEND
T = ACTUAL (DESIRED) TORQUE
Y = APPARENT (INDICATED) TORQUE
L = EFFECTIVE LENGTH LEVER
E = EFFECTIVE LENGTH OF EXTENSION
Open-End Wrench Adapter
TORQUE WRENCH
WRENCH DRIVE CENTERLINE
ADAPTER DRIVE CENTERLINE
HANDGRIP CENTERLINE (PREDETERMINED)
E
L
Flare Nut Wrench Adapter
FORMULA TxL / L-E = Y
EXAMPLE: (WITH "E" AS MINUS DIMENSION)
T = 135 LB. IN.
Y = UNKNOWN
L = 10.0 IN.
E = 1.5 IN.
Y = 135 x 10 / 10 - 1.5 = 1350 / 8.5 = 158.82
Y = 159 LB. IN.
Spanner Wrench Adapter

Figure 2.2.3 Torque Wrench with Various Adapters
(from AC43.13-1B, Figure 7-2)

2.3 Fastener Use and Discretion

2.3.1 Fastener Lengths

Rivets: Where replacement or repair of rivets is required, use rivets of proper specifications only. For instance, MS203426AD4-xxx. Lengths may be determined by measuring the thickness of the material(s) to be assembled and adding 1.5" X Diameter of the rivet to be used. Over-sized rivets may be substituted where holes have been drilled out.

Bolts and screws shall have a minimum of one thread visible through the nuts upon final torque.

Washers may be rearranged if necessary to accommodate proper fit, up to two washers beneath the nut and one beneath the fastener head. Typically, Aerocet intends to put one thin washer beneath the fastener head and one thicker washer beneath the nut.

2.3.2 Fastener Reuse

Fasteners are to be inspected for condition, per Section 9 of this manual. Such fasteners that are acceptable may be cleaned, re-lubricated and re-installed as determined. Self-locking nuts shall meet the minimum prevailing torque as listed in Figure 2.2.2, or shall be replaced.

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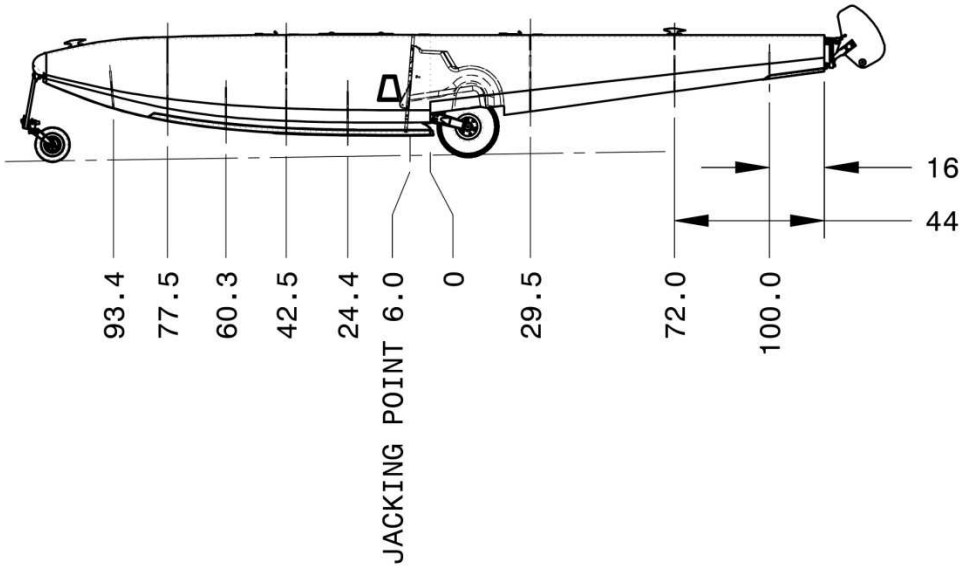
3 Float Handling and Jacking

In order to service the landing gear parts and to do retraction tests, the floats are jacked up and blocked using a floor jack with at least 1 ton capacity. Raise only one float at a time, chock the opposite float properly and assure proper balance. The best lift point is 6 inches ahead of the step on the keel. This locates the jack directly under the main bulkhead in the float. If space permits, use a board in between the jack and the keel. After raising the float, block the float in a couple of places ahead of the step. Use a sawhorse to support the after body of the float to keep the plane from tipping back. Locate a sawhorse support under one of the back bulkheads which are located 16" or 45" forward from the stern. Jack the other float carefully to a height that will clear the landing gear for retraction tests and repeat supports to this side as well to assure stability before climbing into aircraft and initiating retraction.

During initial installation or for maintenance and retraction tests if convenient, the lifting rings on the top of the fuselage provide the proper points to attach a lifting harness to elevate the complete airplane. The hoist should have a capacity of least 2 tons and a proper lifting harness to assure that the pull on the lift rings is vertical must be used.

The airplane may be lifted with either a launching dolly or large forklift under the spreader bars. Care should be taken to lift as closely as possible to the float hulls without touching the hulls.

Figure 3.1.1.



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4 Nose Gear

4.1. General Description

The nose gear utilizes a composite fiberglass strut to absorb energy on landing along with the deflection of the nose tire. The nose gear is full swiveling, utilizing braking for steering, and incorporates a centering device to keep the nose gear aligned for landing. Retraction of the nose gear is done by a hydraulic ram which pulls the gear along a slide track stowing the landing gear strut into a box in the nose of the float leaving the tire exposed on the front of the float. A towing lug is located on the lower clamp block. Reference should be made to Nose Gear Assembly 35A-CPL-42000, Sheets 1 & 2 and Lower Nose Gear Dwg. No. 35A-42100, Sheets 1-3.

4.2. Nose Gear – Partial Removal – Reference 35A-CPL-42100, Sheets 1-3

1. Make sure gear is in the down position and hydraulic gear motor circuit breaker is pulled.
2. Jack up the airplane according to Section 3.
3. Unbolt the bottom block from the composite nose spring.
4. Second option – pull the centering pin and two lock pins (P/N 35A-42129, on later model or retro-fitted floats) from the bottom block and dropping out the lower nose fork assembly.

4.3. Nose Gear – Full Removal of the Nose Gear (apart from the gear box and riveted on slide brackets) – Reference 35A-CPL-42000, Sheets 1 & 2; 35A-CPL-42100, Sheets 1-3; and 35A-CPL-42300, Sheet 1.

1. Remove bumper by unscrewing the four screws that hold it on.
2. Remove the composite nose spring.
3. Retract the nose gear cylinder.
4. Disconnect and plug the hydraulic lines from the hydraulic piston.
5. Pull the box cap of the gear box by removing the 10 AN3 fasteners. The box cap is sealed into place using single part urethane adhesive. Care must be taken to break the seal, yet not damage the mating parts.
6. Be careful of the wiring for the position sensors. Note the position of the up position sensor for reassembly. They don't need to be disconnected if the hydraulic piston is pulled back only a short distance.
7. Slide the box aft along with the hydraulic piston revealing the lock bushings and slide bushings.
8. Clean and Inspect the gear box tracks for wear.
9. Inspect and replace slide pins as necessary
10. Inspect and replace lock bushings and slide bushings as necessary
11. Inspect slide truck and lock bracket for wear and replace as necessary.
12. If removal of the rod end, part 35A-42403, from the nose gear hydraulic actuator is necessary, it will dictate readjustment upon reassembly. Mark with a permanent marker or masking tape the original location of the rod end on the actuator rod prior to disassembly to aid in the reassembly process.

4.4. Reassembly of the Nose Gear to the Nose Gear Box – Reference 35A-CPL-42000, Sheets 1 & 2; 35A-CPL-42100, Sheets 1-3; 35A-CPL-42300, Sheet 1; and 35A-CPL-42400.

1. Assemble in reverse order 4.3. Make sure the lock bracket, part 35A-42252, is positioned with the grease holes facing out.
2. Setting the proper adjustment of the rod end to the hydraulic piston is critical.
3. Assure that the rod end, part 35A-42403, is screwed onto the nose gear hydraulic actuator at least as far as it was prior to disassembly. If uncertain, screw the rod end onto the actuator until it bottoms. (Danger – if the rod end adjustment is incorrect the piston rod may be bent with full gear extension)
4. Put the gear into the down position and adjust the rod end to the piston rod until the lock bushings, part 35A-42254, just touch the end of their travel in the slide brackets. Tighten the jam nut to the rod end to secure position. Use tool 35A-T42400 to help facilitate this.
5. It should be noted that the gear down position sensor should be adjusted as far forward as possible with full contact on the hydraulic cylinder, part 35A-42436. This will cause indication when the lock bracket comes into a roughly vertical position. The lock bushings and lock bracket travel beyond this point however when positioned properly.
6. The gear up position sensor should be located on the hydraulic cylinder to activate when the gear is in the fully retracted position. It should be noted that if the position sensor is too far forward, it may not indicate when the gear is fully up because the magnetic ring passes by the sensor. A single tie wrap on the aft or forward side of the bulkhead along with sealant is adequate to hold the sensor in position.
7. The two AN4-47A bolts position the width of the slide brackets, parts 35A-42022(L&R). These should be tightened to allow 1/8” movement of the nose spring, part 35A-42130, where the bottom block, part 35A-42126, attaches. Too tight is binding and too loose allows wear and shimmy possibilities.

4.5. Removal of the Complete Nose Box and Gear from the front of the float – Reference 35A-CPL-42000, Sheets 1 & 2; 35A-CPL-42100, Sheets 1-3; and 35A-CPL-42300, Sheet 1.

1. Remove bumper by unscrewing the four screws that hold it on.
2. Disconnect and plug the hydraulic lines from the hydraulic piston.
3. Remove the position sensors and tie them back to protect them damage.
4. Remove the 1/8” pipe and fitting from the front of the hydraulic actuator and the aft hydraulic tube fitting from the rear.
5. Remove the 10 fasteners which hold the slide brackets onto the front of the float. Remove the 4 fasteners which hold the rear of the nose box to the attach brackets.
6. Pull the complete nose box and gear forward including the hydraulic actuator.
7. Note that single part urethane sealant is used where the box attaches to the front of the float and seals the bolts that hold it on.
8. Reverse these procedures for installation

4.6. Nose Wheel Removal and disassembly – Reference 35A-CPL-42100, Sheets 2 & 3; and nose wheel drawing 35A-CPL-50000.

1. Make sure gear is in the down position and hydraulic gear motor circuit breaker is pulled.
2. Jack the airplane according to Section 3.
3. Remove cotter pin, castellated nut, and AN8-50A bolt.
4. Note position of tensioner bushings and Stat-O-Seal.
5. **Be sure to deflate tire before any disassembly of the nose wheel**.
6. Disassemble wheel as necessary.
7. Note condition of wheel bearings, bearing seals, tensioner bushings and Stat-O-Seal. Replace as necessary.

4.7. Nose Wheel Installation - Reference 35A-CPL-42100, Sheets 2 & 3.

1. Reverse procedures in Section 4.2.
2. Be sure to thoroughly clean and re-pack wheel bearings, bearing seals, and coat the axle bolt with marine grade waterproof grease. Note: Apply spray film to these seals every 25 hours after placed in service. Also, some greases are not compatible with one another, thoroughly clean all old grease lubricant from the wheel cavity and bearing cones before re-packing. Observe all manufacturer's instructions.
3. Assure that the AN8-50A bolt has its head on the left side looking forward and engaged in the fork notch to keep from rotation.
4. The Stat-O-Seals are used to keep water from entering along the bolt and bypassing the wheel seals.
5. Tighten the castellated nut enough to ensure that the tensioner bushings don't rotate when the wheel spins, yet not bind up the bearings.
6. Install cotter pin.
7. Check the pressure in the 10 X 3.50-4 tire. Pressure should be 70 psi.

4.8. Nose Centering Pin and Nose Pivot Pin Service - Reference 35A-CPL-42100, Sheets 1 & 3.

1. Remove centering pin according to exploded view.
2. Check wear on pin. This is done by noting that the tire will want to center in the trail position. There should be no more than 3/16" free travel, side to side, at the axle. There should be no more than 1/16" (.063") vertical movement of the nose block. Replace as necessary.
3. The heat treated pivot pin, part 35A-42110, is heat shrunk into the nose block. The nose block and pivot pin are supplied from Aerocet, Inc. assembled. If the pivot pin is pressed out, the anodized surface is opened up causing dissimilar metal contact between the two components when reassembled.
4. Lightly grease all parts prior to reassembly using marine grade waterproof grease. **Be careful not to introduce too much grease around the compression spring causing it to hydraulic lock.**

5. Lightly grease through the grease fitting on the top of the bottom block. Initial amounts should be two **very** slow pumps with a conventional hand grease gun. Continually check pivoting action of the nose assembly to assure proper function, watching for hydraulic lock and proper vertical movement. If too much grease has been introduced, push down on the grease check ball and rotate the nose gear 360 degrees a couple of times to expel excess amounts.
6. Introduction of grease through the grease fitting during normal operation should be minimal (**1/2 pump max of a hand grease gun per week**) always watching for hydraulic lock and any damage from grease gun pressure.

Caution: Be very slow introducing grease into the grease fitting on the bottom block in order to keep from putting too much pressure on the internal components. Grease guns can develop incredible force.

5 Main Gear

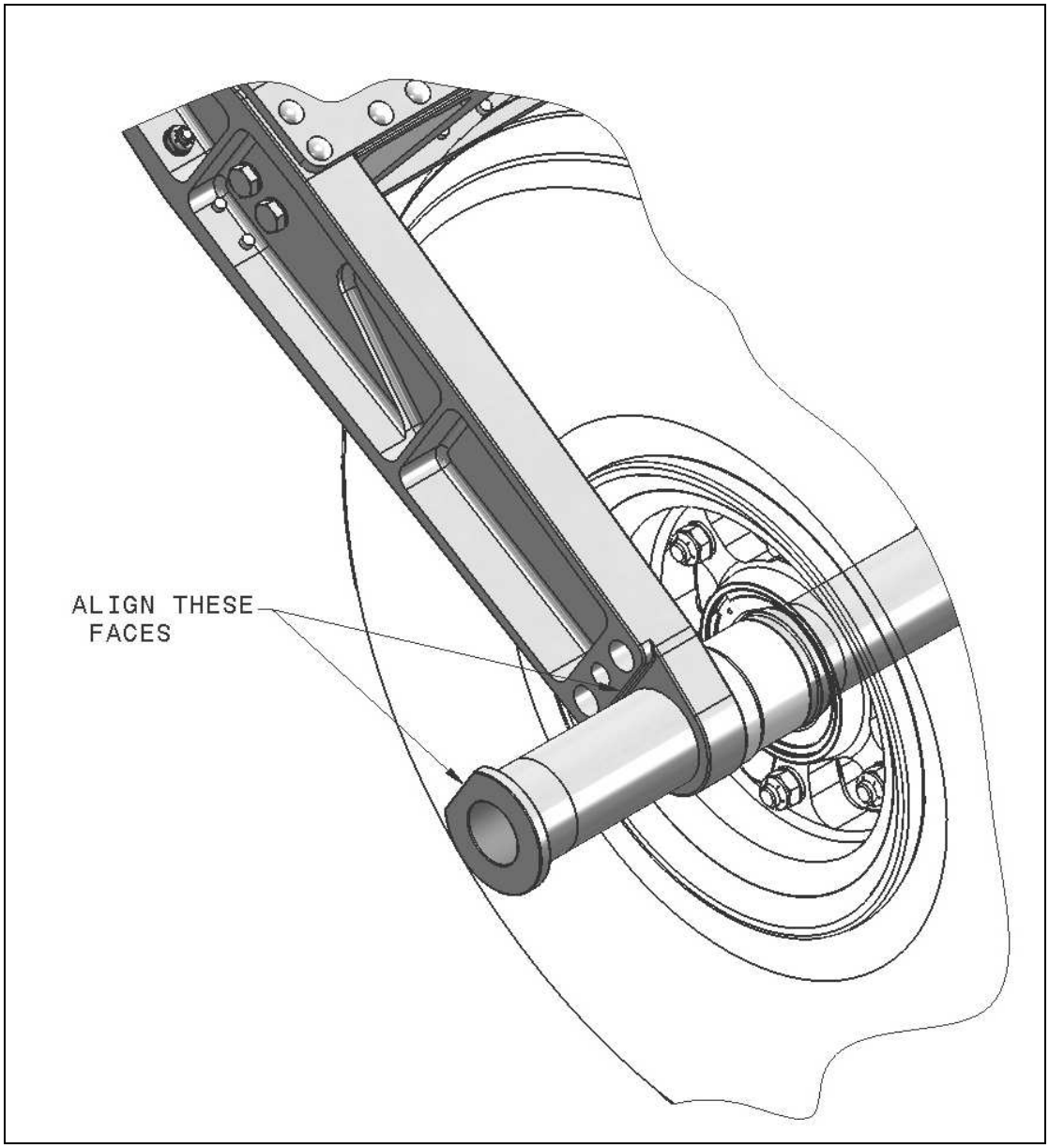
5.1. General Description

The main landing gear utilizes a trailing arm link design using a 6.00 X 6 tire and a oleo shock strut. The main gear is retracted and held in the up position by a hydraulic actuator. There are no up-locks to fail and the geometric design allows the actuator to hold the gear in the up position under high G forces with low hydraulic pressures. In the down position, the oleo and drag link, travel into an over center position against the stop bracket. When the gear is in the down position, this position is maintained even without hydraulic pressure, with two springs assisting the over center position. Proximity sensors are used to give gear position information to the landing gear advisory.

5.2. Main Wheel Removal & Assembly – Reference 35A-CPL-45700. Consult Parker/Cleveland Maintenance Manual and Parts Catalog or Aerocet Component Maintenance Manual A-10036 for wheel and brake maintenance and repair.

1. Make sure gear is in the down position and hydraulic gear motor circuit breaker is pulled.
2. Block and jack the airplane according to Section 3.
3. Remove brake pads and slide caliper free from brake mount. One need not disconnect the brake line, unless further inspection and maintenance to the brake system is intended. Secure the caliper in a manner that does not stress the brake hose.
4. Remove brake mount.
5. Remove axle. Note larger tensioner bushing is on the brake caliper side.
6. Slide wheel down and away from the truck assembly.
7. **Be sure to deflate tire before any disassembly of the main wheel**.
8. Inspect all components for corrosion, and wear according to procedures provided by Cleveland Wheels and Brakes Maintenance Manual.
9. Reassemble in reverse order of disassembly. Consult the proper Component Maintenance Manual for further inspection and maintenance of wheel and brake assemblies.
10. Assure the notch in the axle lines up with the inset on the left side arm of the truck assembly. (See Figure 5.2.10)
11. Tighten the axle nut assuring the proper amount of friction on the wheel bearings. Use procedures outlined in the appropriate Component Maintenance Manual; or
    a) Fully tighten axle nut until the tire and wheel assembly begin to drag when spun. (This will assure that the tapered roller bearings are seated properly.)
    b) Loosen the axle nut until the wheel assembly will spin freely again. (No torque)
    c) Tighten the axle nut until the nut begins to tighten, but the wheel assembly spins freely and has no perceptible play. Axle nut may be backed off to align the nearest slot to the nearest cotter hole – no more than ¼ turn is necessary.
12. Install cotter pin through the axle nut.
13. Install brake mount and brake.

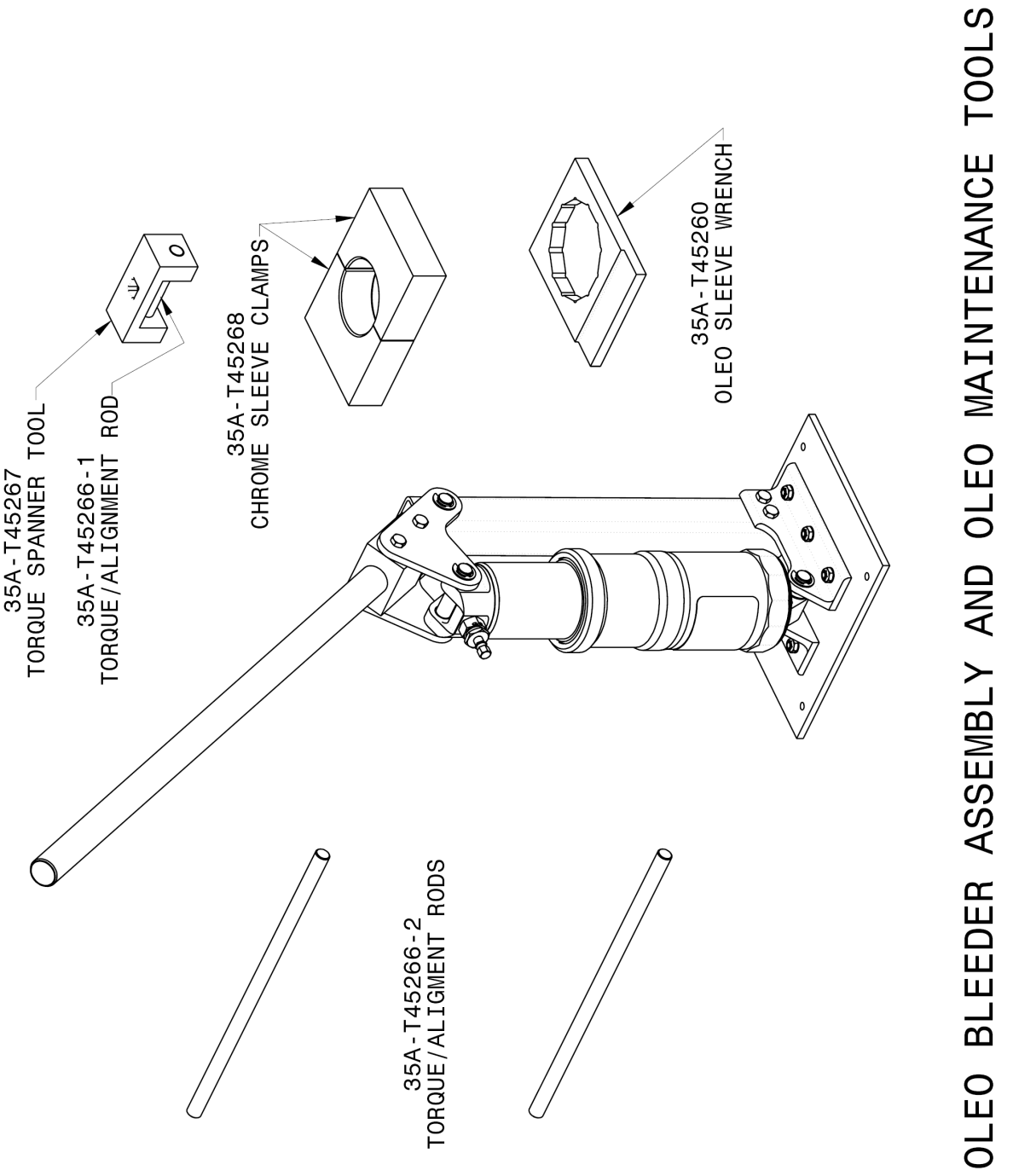
Figure 5.2.10



5.3. Oleo Removal and Disassembly – Reference 35A-CPL-45000, Sheets 2,6,7; and 35A-CPL-45200, Sheets 1 & 2. (Oleo Bleeder Assembly 35A-T45200 may be available from Aerocet upon request. See Figure 5.3)

1. Make sure gear is in the down position and hydraulic gear motor circuit breaker is pulled.
2. Block and jack the airplane according to Section 3.
3. Remove the oleo by pulling shear pins.
4. Keep oleo upright on the bench.
5. Hook a length of ¼" clear plastic tubing to the charge valve and locate the other end in a clean bucket.
6. Release the oleo pressure while keeping the base of the charge valve from turning out from the top cap using a ¾" wrench and slowly release the oleo pressure by undoing the valve lock nut counter clockwise.
7. Compress the strut to discharge all the fluid from the cylinder. This is done by using a ½" steel rod positioned through the top cap bushings and pressing down on the cylinder. Protect the bottom cap from damage by placing it on a piece of wood or rubber. Bench service tool (Oleo Bleeder Assembly) 35A-T45201 provides an easier leveraged way to facilitate this and keep alignment.
8. Using the Oleo Sleeve Wrench 35A-T45260, remove the bottom cap from the oleo. Locate the service wrench in a vise. Position the oleo bottom facets into the wrench. Place a ½" steel rod through the bottom cap bushings and unscrew the bottom cap from the oleo bottom in a counter clockwise motion. Drain residual fluid into the bucket. Check fluid for contamination.
9. Remove the high pressure charging valve.
10. Push the top cap and chrome upper down through the oleo bottom.
11. Service all available seals as necessary.
12. Further disassembly may be accomplished by removing the internal snap ring and metering insert.
13. The top cap may be removed from the chrome upper by clamping the chrome using Chrome Sleeve Clamp 35A-45268 in a vise. Unscrew the top cap, counter clockwise, using the ½" rod. Make sure the clamp tools surfaces are perfectly clean before use.
14. Top cap seals may be serviced at this time.
15. The metering rod should be examined for damage; and, if removed, should be safety wired back upon replacement.
16. Examine I-Glide bushings and replace as necessary.

Figure 5.3.


OLEO BLEEDER ASSEMBLY AND OLEO MAINTENANCE TOOLS
35A-T45267
TORQUE SPANNER TOOL
35A-T45266-1
TORQUE/ALIGNMENT ROD
35A-T45268
CHROME SLEEVE CLAMPS
35A-T45260
OLEO SLEEVE WRENCH
35A-T45266-2
TORQUE/ALIGMENT RODS

5.4. Oleo Assembly – Reference 35A-CPL-45000, Sheets 2, 6, 7; and 35A-CPL-45200, Sheets 1 & 2.

1. In general reverse disassembly procedures.
2. Lube all seals before putting them into place. Assure that all Polypak seals face correctly for keeping the pressure in the oleo. The lip side of the seals should face to the inside of the oleo.
3. Reassemble the top cap to the chrome upper if these were disassembled. Lube the threads with grease. Holding the chrome upper using the Chrome Sleeve Clamp 35A-45268 in a vise, screw the top cap back into place. Torque the top cap to the chrome upper using Torque Spanner Tool 35A-T45267 and a ½" rod inserted through the I-Glide bushings.
   Torque should be 80 foot-pounds.
4. Set in place the metering insert, but do not snap ring in. It is easy to fill the oleo with fluid with this removed as described in step 7.
5. Push the top cap and chrome upper through the seals on the oleo bottom. Use a large socket and dead blow hammer to assist in getting the chrome upper started through the seal and wiper, pushing on the metering insert. Continue pushing until at least ¼" of the chrome sleeve is showing through the rod wiper.
6. Install the high pressure charging valve.
7. Remove the metering insert, turn the oleo upside down, and fill the chrome upper to within 1.25" inches of the snap ring inset with MIL-H-5606 aircraft hydraulic fluid. Put the metering insert back into place assuring the dome is properly positioned as shown in the figure. Put internal snap ring into place.
8. Reassemble the bottom cap to the oleo bottom and torque should be 80 foot-pounds using Oleo Sleeve Wrench 35A-T45260 and Torque Spanner Tool 35A-T45267.
9. Align the top cap shear pin holes with that of the lower cap. Use the two ½" rods and eye their alignment. Turn the chrome upper and top cap clockwise to align the lug holes.
10. Fill the oleo with the proper amount of fluid. Assure the oleo is upright as it would be in the float. The use of the Oleo Bleeder Assembly tool 35A-T45201 helps facilitate this process and assures final alignment of the pin holes when charging the oleo with nitrogen. Hook a clear piece of tubing to the charge valve. Place the other end into a clean bucket of MIL-H-5606 aircraft hydraulic fluid. Cycle the oleo full travel slowly. Repeat stroking the oleo full travel slowly until there is little or no air in the tubing.
11. Check final alignment.
12. Charge the oleo using nitrogen according to the placard on the oleo. This can be done in the Bleeder Assembly tool to assure alignment. 500 psi for 3735 lb gross weight, 470 psi for 3600 lb gross weight, 425 psi for 3350 lb gross weight, and 350 psi for 2950 lb gross weight.
13. Replace oleo into the float using shear pins, washers, and cotter pins or retaining rings. Retaining rings have been a later improvement and new rings and securing hardware may be substituted in place of the original cotter style if desired.) Assure that the top shear pin is oriented with the cotter pin toward the right side of the float (looking forward).

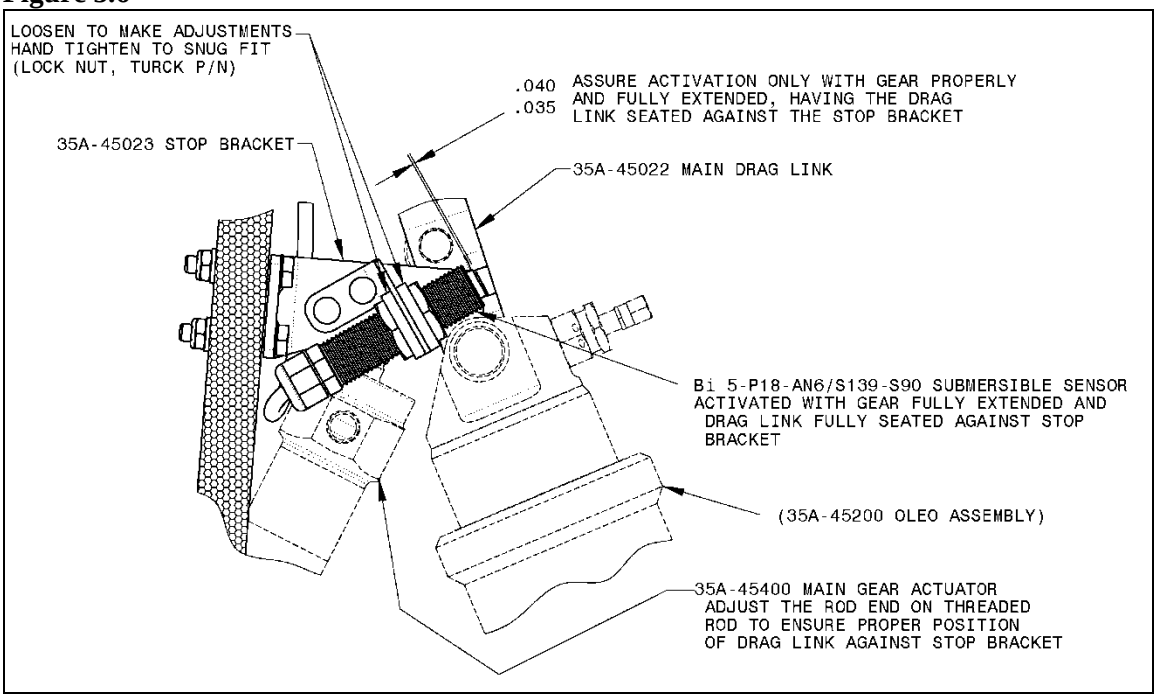
5.5. Complete Disassembly of Main Gear – Reference 35A-CPL-45000, Sheets 2-7.

1. Make sure gear is in the down position and hydraulic gear motor circuit breaker is pulled.
2. Jack the airplane according to Section 3.
3. Remove oleo and main wheel according to Sections 5.2 and 5.3
4. Remove truck assembly according to sheet 2.
5. Remove extension springs and drag link according to sheets 2-4.
6. Disconnect hydraulics as necessary and remove the main gear hydraulic actuator. Note the seals on the bolt that attaches the actuator to the main bulkhead.
7. Any brackets and the submersible sensor may be removed.
8. Check all parts for corrosion and I-glide bushings for wear. Replace as necessary.

5.6. Complete Assembly of Main Gear including adjustment of submersible sensor and main gear hydraulic actuator – Reference 35A-CPL-45000, Sheets 1-7.

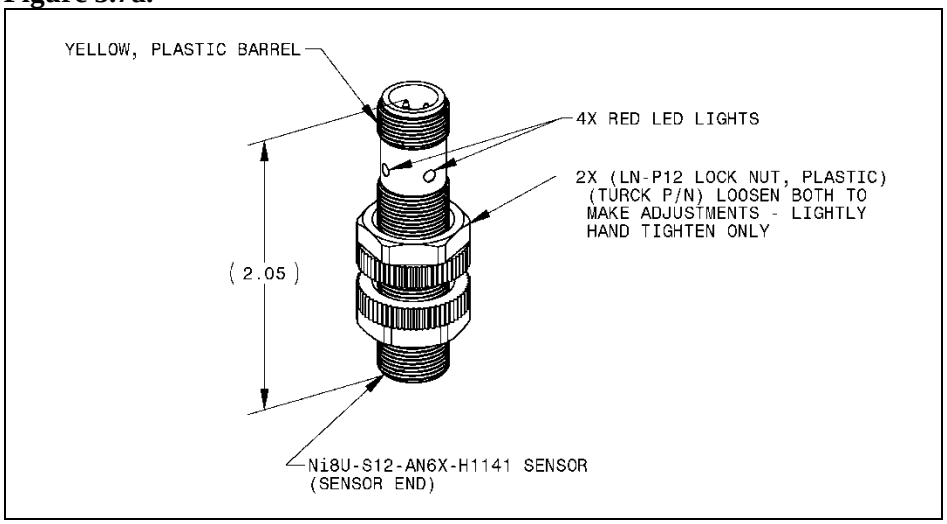
1. Reverse procedure in Section 5.5 with the following particulars.
2. Any attachment hardware and bolts that pass through the bulkhead should be sealed with a one part urethane adhesive to assure water tightness.
3. When installing the main gear hydraulic actuator back into the bulkhead, note that there is a Stat-O-Seal washer on the head side of the bolt and a Thred-Seal washer on the thread side of the bolt. (Aerocet also recommends use of a one-part, urethane, marine-grade sealant here as well, such as Sika-Flex 292 – Do not use silicone.)
4. Install the drag link assuring the placement of the plastic spacer (item 11) to protect the extension spring from contacting the drag link during operation.
5. After installing the drag link and affixing it to the hydraulic actuator, adjust the rod end so that the drag link rests firmly against the stop bracket with the hydraulic actuator fully retracted. The system must be powered up to assure that the actuator is fully retracted (main gear in down position). Be careful when doing this with floats properly jacked up according to Section 3. Add 3/4 turn of thread (clockwise motion) into the rod end allowing for assurance of force against the stop. Do not allow more than this as the travel of the actuator rod in the extended position sets the wheel height in the wheel well for water operation.
6. The Gear Down (submersible) sensor is adjusted so that the drag link sensor tab is .035-.040" away from the face of the sensor when the drag link is in the complete retracted position. It is very important that the sensor does not trigger prematurely. Assure that the drag link is "over-centered" and against the stop bracket at the time that the sensor is triggered. (See Figure 5.6)

Figure 5.6


LOOSEN TO MAKE ADJUSTMENTS
HAND TIGHTEN TO SNUG FIT
(LOCK NUT, TURCK P/N)
.040
.035
ASSURE ACTIVATION ONLY WITH GEAR PROPERLY AND FULLY EXTENDED, HAVING THE DRAG LINK SEATED AGAINST THE STOP BRACKET
35A-45023 STOP BRACKET
35A-45022 MAIN DRAG LINK
Bi 5-P18-AN6/S139-S90 SUBMERSIBLE SENSOR ACTIVATED WITH GEAR FULLY EXTENDED AND DRAG LINK FULLY SEATED AGAINST STOP BRACKET
(35A-45200 OLEO ASSEMBLY)
35A-45400 MAIN GEAR ACTUATOR
ADJUST THE ROD END ON THREADED ROD TO ENSURE PROPER POSITION OF DRAG LINK AGAINST STOP BRACKET

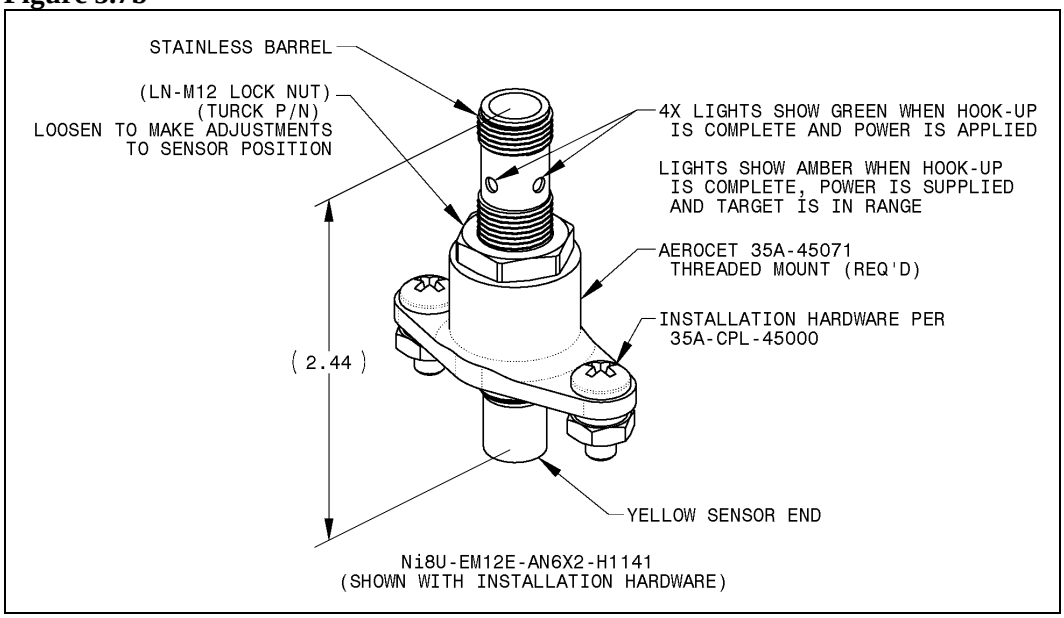
7. The gear up position sensor is adjusted to where the drag link triggers it within 1/8" of full up travel. There are now two versions of gear retracted sensors. One is the original, having a yellow plastic barrel and red light. The newer version has a stainless barrel and is somewhat longer. Both hook up electrically in the same manner. The newer does require an additional threaded mount from Aerocet, 35A-45071. (See Figures 5.7a and 5.7b for an illustration of the two sensors.)

    a. Ni8U-S12-AN6X-H1141 Sensor (Originally supplied): With proper hook up, this sensor will activate red lights in the upper barrel when the target (main gear drag link) is in range. If the plastic barrel is broken, the light will remain on no matter the gear position.
    Figure 5.7a.


YELLOW, PLASTIC BARREL
4X RED LED LIGHTS
2X (LN-P12 LOCK NUT, PLASTIC) (TURCK P/N) LOOSEN BOTH TO MAKE ADJUSTMENTS - LIGHTLY HAND TIGHTEN ONLY
(2.05)
Ni8U-S12-AN6X-H1141 SENSOR (SENSOR END)

b. Ni8U-EM12E-AN6X-H1141 Sensor (Supplied as original or as replacements after 12/08): With proper hook up, sensor will activate green lights in the upper barrel. These lights will become amber when target (main gear drag link) is in range.

Figure 5.7b



6 Landing Gear Retraction System

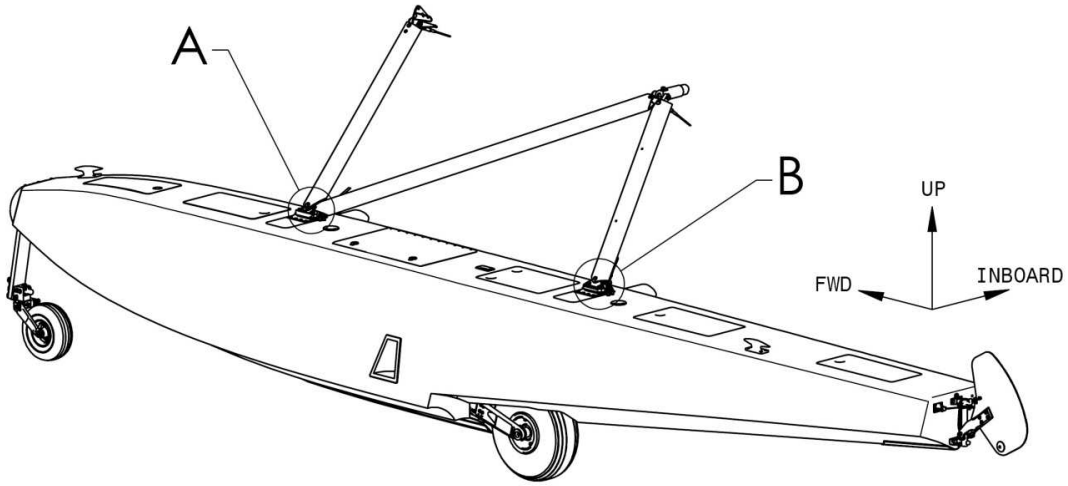
6.1. General Description

Normal landing gear extension and retraction is accomplished by hydraulic actuators for each gear. The hydraulic system is powered by a reversible, electrically-driven hydraulic pump. Hydraulic pump operation is initiated by moving the landing gear switch on the gear advisiory to either the up or down position. The landing gear will travel to the position indicated, cycling the electrically-driven hydraulic pump. The pump is shut off by pressure switches. When the pressure switch senses a certain amount of pressure in the hydraulic line, which the electric pump is forcing fluid through, it will send a signal to the motor relay shutting down the pump. The pressure increases at the end of operation when all the actuators have traveled to the end of their stroke. Eight position-indicator lights (four gear up and four gear down) are provided to show landing gear position. An additional indicator light shows landing gear motor operation. The landing gear system is also equipped with an emergency hand pump selector valve and hand pump.

6.2. Hydraulic Lines – Reference 35A-CPL-47000, Sheets 1-8; and 35A-60010, Sheet 1.

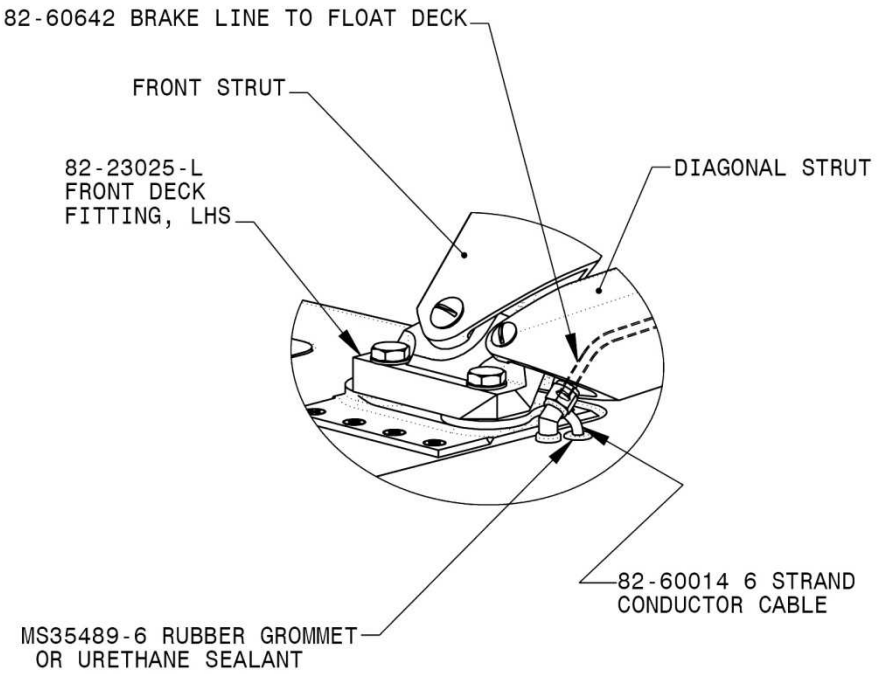
1. All hydraulic lines are serviceable according to the drawings. The aluminum lines are made up of 5052-0, ¼" outside diameter, .035" wall, with conventional 37 degree flared ends. These can be purchased by part number or made up by a certified mechanic. The flexible lines are custom sized and may be purchased according to their part numbers.
2. Assure lines are all clean and flared properly upon replacement.
3. Hydraulic lines that run up the struts need to be placed in position prior to installation of the aircraft onto the floats. Assure that the lines are centered in the struts as they enter from either end not allowing wear from vibration. Also assure that the step attachment bolts clear the lines upon installation.
4. All hydraulic lines need to be clear of all electrical and control cables, and must be secured and isolated from surrounding structures to avoid damage during service. (Ref AC-43.13)

Figure 6.2.1. Hydraulic lines for 182, 206 similar, see drawings.



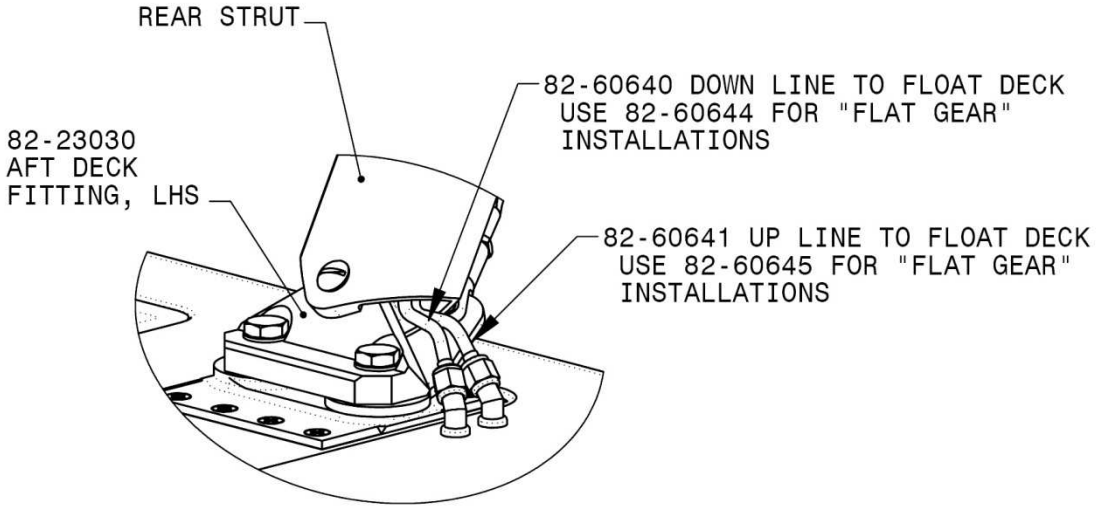
CESSNA 182 INSTALLATION SHOWN

Figure 6.2.2.



DETAIL A
SHOWING FWD DECK FITTING, LHS
RHS OPPOSITE ALONG CENTERLINE
REF DWG. NO. 82-60014 FOR INSTALLATION DETAILS

Figure 6.2.3.



DETAIL B
SHOWING AFT DECK FITTING, LHS
RHS, OPPOSITE ALONG CENTERLINE
HYDRAULIC INSTALLATION DETAILS PER DWG. NO. 82-60014

CESSNA 182 INSTALLATION SHOWN

NOTE

“UP” OR RETRACT LINES ARE ALWAYS INSTALLED INBOARD; AND “DOWN” OR DEPLOY LINES ARE ALWAYS INSTALLED OUTBOARD, ON ALL MODEL 3400 FLOATS.

Figure 6.2.4. Showing Cessna 180 or 185 or 206, FWD Deck Fitting, Hydraulic Fittings and conductor cable installation.

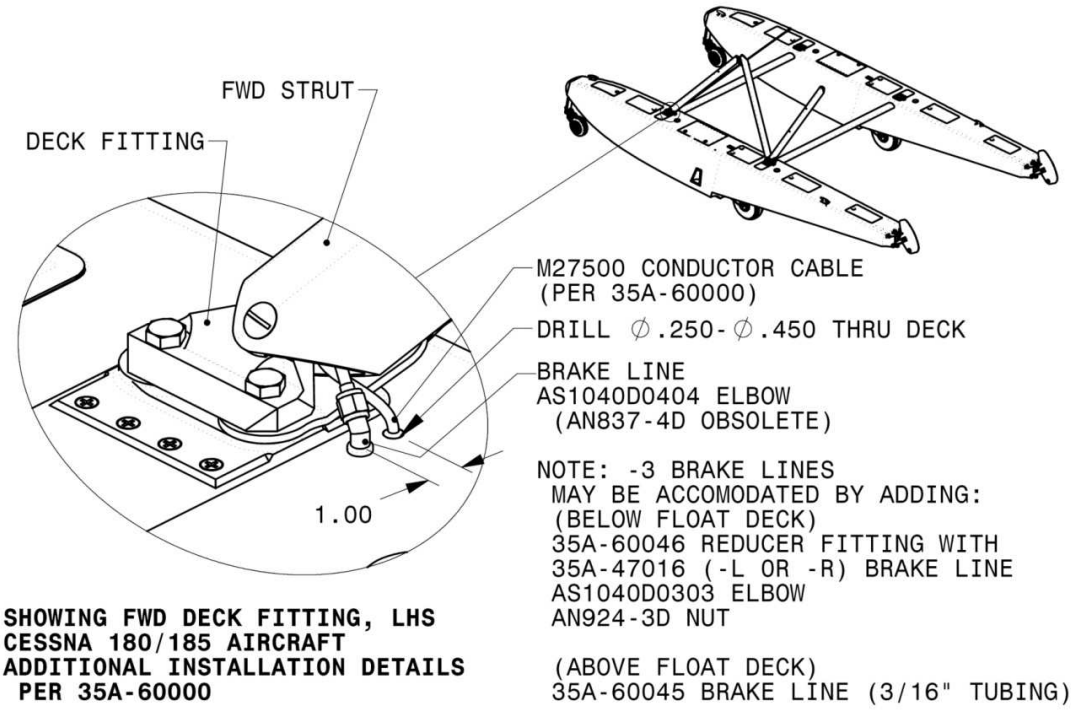
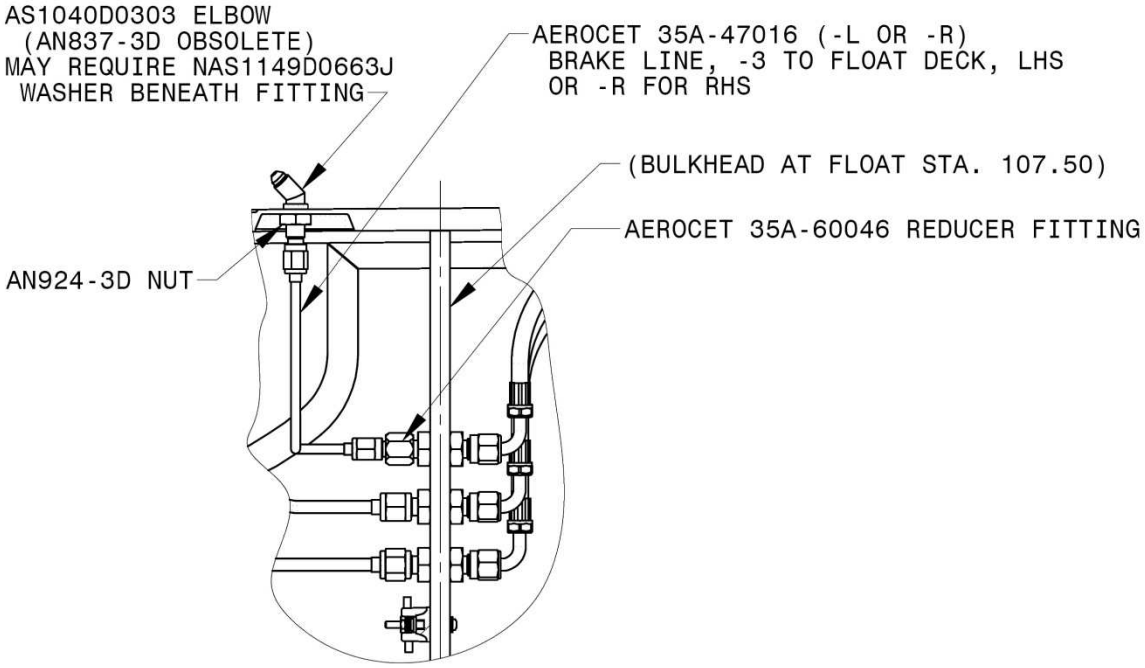


Figure 6.2.5. Showing Available Aerocet -3 Brake Line Conversion



6.3. Hydraulic Actuators – Reference 35A-CPL-42400, Sheet 1, 35A-CPL-45300, Sheet 1, and 35A-CPL-45400.

1. Both the nose and main gear actuators can be rebuilt.
2. Disassemble according to the reference drawings.
3. Note that the nose gear actuator incorporates a ceramic magnet to trigger the nose gear sensors. This is located on the piston nose behind the retaining washer.
4. Inspect and replace all seals and any damaged parts for service.
5. Pre-lube all seals and mating surfaces with a lithium grease.
6. Upon reassembly assure that the ports in the piston caps line up with the holes in the cylinder. (Applicable to 35A-42400 & 35A-45300 assemblies only)
7. For 35A-45400 Main Gear Actuator, similar procedures may be followed by referencing illustrations in 35A-CPL-45400. Hydraulic fitting on the top end must be removed before removing end cap, or damage may occur.

6.4. Electrical Diagrams – Reference 35A-46010 and/or 35A-60015, as applicable (Drawing included in back of Service Manual).

6.5. Electric-Hydraulic Pump – Reference 108 Series Power Unit Drawings included in back of Service Manual.

1. Remove return line on lower reservoir and drain oil.
2. Remove reservoir tank by loosening screw on bottom of tank
3. Note the cleanliness of the pick up filters – these are friction fit into place – clean as needed.
4. The thermal relief is set at 1100 +100/-100 psi and the pressure relief is set at 800 +100/-100 psi. from the factory. Reference the Power Unit Drawings for adjustment if necessary. **Note**: These settings are very fine, and Aerocet does not recommend making adjustments unless it is necessary.
5. It should be noted that the Pressure switches (electrical), which turn the pump on and off, are at a lower setting. These have a range from 350-500 psi.
6. It should also be noted that the dipstick is replaced with a breather plug and the hydraulic fluid filled through this orifice.
7. Reassemble in reverse order of disassembly.
8. The reservoir should be filled to **one inch from the top of the sight gauge**. On initial installation the fluid will go down dramatically as it fills the lines. Don't run the pump dry. Stop as necessary, refilling the reservoir to maintain the proper level until all the air is out of the system.

9. Troubleshooting Hints:

- Pump will not start
    i. Check circuit breaker. Replace if necessary.
    ii. Check motor ground and wiring. Repair if necessary. (Ref 35A-60015 for schematic)
    iii. Faulty pressure switch – motor will not start at low cut in or will not shut off at completion of cycle. Replace Switch if necessary.
    iv. Faulty solenoid pressure switch – motor will not start. Replace Pump if necessary.
    v. Faulty or dirty pressure relief valve – clean and check. (Refer to exploded view and instructions in the back of the manual.)
    vi. Pressure build up in system from both sides of up and down lines :
    Background: The accumulator tubes that are mounted to the hydraulic pump serve to absorb pressure variations from two primary sources. Pressure can build up in the system due to environmental variations such as extreme temperature swings or with altitude. The tubes also absorb the differences in the volumes of the gear actuators, being retracted or being deployed. (The piston and shaft in an actuator assembly causes a difference in the volumes in the different gear configurations.)
    To diagnose: Cycle hand pump selector into up and down positions to relieve the pressure and return to "OFF" position. In this circumstance the pump will then operate normally.
        1. If this problem persists, check the seal on the accumulator tubes (35A-60025) at the pump. Empty the tubes of all hydraulic fluid, replace and assure seal at all fittings.
        2. Replace the original straight tubes with 35A-60025-2 parts that have a greater volume and may resolve this problem. (These are a coiled tube and are easily differentiated from the "-1" style, which is straight.)
        3. The pump itself may not be working properly. It may be necessary to bench test it or isolate it from the system for testing. Replace the pump if tests fail.
- Gear stops mid-position: Pump cuts off
    i. Binding gear – will shut motor off because of a premature pressure build up.
    ii. Pressure switch failure. (Uncommon)
- Pump running continuously or intermittently (without pilot input):
    i. Hydraulic leak – Inspect all connections and look for fluid along all routes.
    ii. No Leak apparent – pump failure or actuator piston seal failure. Isolate the pump and each actuator for pressure tests. Replace the pump, or repair the actuator.

- Slow gear operation:
    i. Mechanical interference: Check gear for damage and debris. Check adjustments, especially for the nose gear assembly. (Ref Sections 4 & 5)
    ii. Check hydraulic lines for damage such as kinks or blockages.
    iii. Check screens, electrical connections, pump gears, motor needs replacing.

6.6. Backup Hand Hydraulic Pump –

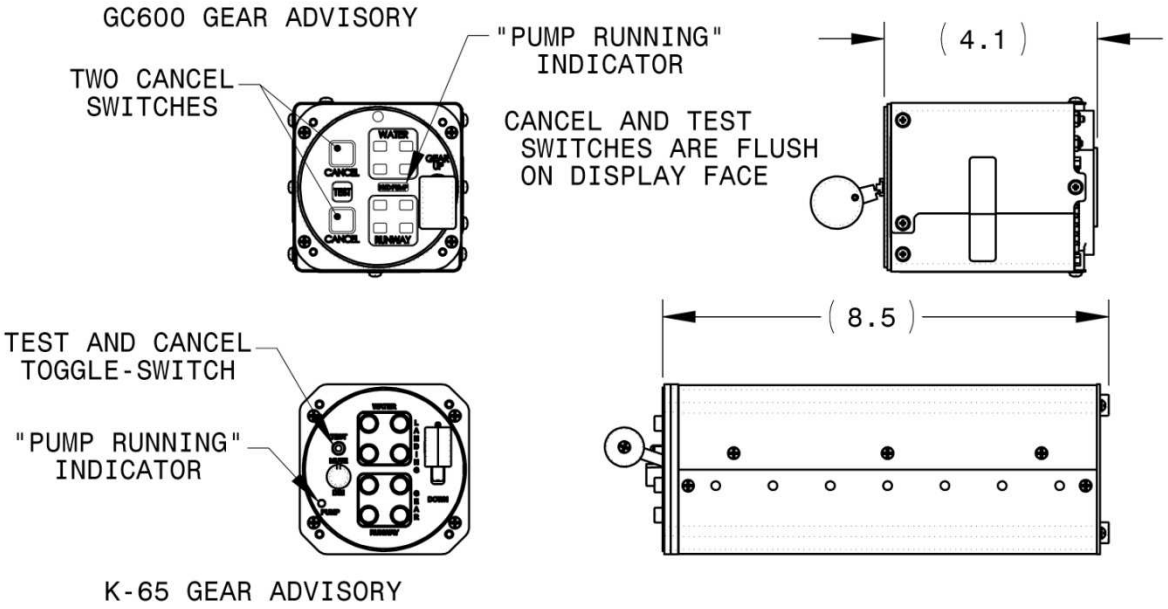
1. Normal operation - the Hand Pump selector handle should be in the “OFF” position.
2. Hand Pump operation should be according to the Pilots Operating Handbook.
3. If pump should leak, contact Aerocet, Inc. for replacement.

6.7. Gear Advisory System - Reference Component Maintenance Manual (CMM) A-10037, or Drawing K-65-CPL.

1. General

For all information regarding the Aerocet Model GC600 Gear Advisory, please refer to CMM A-10037. (See illustration for comparison between the K-65 and GC600 units) The newer GC600 is designed to be a direct replacement for the K-65. Both fit the same panel opening, and accept the same wiring connector and hook-up. The K-65 will not be readily available after 11/09. K-66 Auxiliary Advisory (optional) is no longer used with the GC600.

Figure 6.7.



The landing gear handle is an electrical switch mounted within the Gear Advisory Unit on the instrument panel, and has two positions (UP for gear up and DOWN for gear down) which give a mechanical indication of the gear position selected. From either position, the handle must be pulled out to clear a detent before it can be repositioned. Moving the handle to UP or DOWN will start the reversible, electrically-driven hydraulic pump in the selected direction of gear travel. Operation of the landing gear system will not begin until repositioning of the handle is complete.

The following information may be applied to K-65 units only.

Eight indicator lights are mounted on the Landing Gear Advisory Unit adjacent to the landing gear handle. The four blue indicator lights, labeled WATER, (positioned respective to their location on the float, i.e. top left – front left gear) show by their illumination that each landing gear is fully retracted. The four amber indicator lights, labeled LAND, illuminate when the landing gear is down – fully deployed. Neither set of lights is illuminated when the landing gear is in transit.

The single red indicator light, labeled PUMP, comes on when current is being supplied to the landing gear motor. If the motor continues running during flight or goes on and off repeatedly, the motor should be shut off by pulling the LANDING GEAR MOTOR circuit breaker, since continual running of the motor can result in premature motor failure. Prior to landing, the circuit breaker should be pushed in to reactivate the circuit. All the indicator lights can be dimmed for night operation using the dimmer knob on the Landing Gear Advisory Unit.

An optional dash mounted remote light system is available to assure gear position. It incorporates two lights, one blue one for water landing (all gear up) and an amber light for land landing (all gear down). These lights do flash when the landing gear is in transit to the desired position (ex. the blue light flashes when the gear is in transit to a gear up water landing position and then becomes a solid blue light when all the gear have reached their gear up positions).

If an indicator light should fail to come on when pressed for testing, remove bulb for a new bulb or double check the circuit by interchanging a bulb from a lit indicator light. The WATER, LAND, and PUMP light circuits are protected by the Landing Gear Advisory circuit breaker, and are therefore independent of the landing gear motor circuit and will function when using the emergency hand pump.

The Landing Gear Advisory Unit includes an audio output that is connected to an audio output source (ie. radio or audio panel) for verbal pilot information regarding gear position. A static and pitot pressure source is connected to the Unit which determines airspeed. The Landing Gear Advisory Unit has a trigger point set at approximately 90 knots. This adjustment is set using a small slotted screwdriver in the hole above the gear handle on the face of the Advisory. Clockwise is for increasing the trigger speed. As the airplane passes through this speed the system is armed. When the airplane slows back through this speed an audio voice will announce the position of the gear and what kind of landing it is suited for. With the gear up the message will say, “Gear up for water landing”. With the gear down the message will say, “Gear down for runway landing”. This message will continue and repeat itself until acknowledged by the pilot by canceling out the message either by the button on the optional dash mount or on the Landing Gear Advisory Unit itself. If the gear goes to a landing position and remains there **without** all four gear in place for a period of time beyond normal cycle time, the gear will advise the pilot that the gear is unsafe with the following message: “Landing gear unsafe, check gear”. The message will repeat until canceled. Upon operational start-up, the Landing Gear Advisory Unit will announce all three messages at once to indicate their availability and this should be canceled using the buttons provided. The audio output level may be adjusted using a slotted screwdriver in the identified place on the back of the unit.

The Gear Advisory unit is a sealed unit and it should be returned to Aerocet , Inc. for any servicing. Aerocet, Inc. endeavors to have exchange units available to minimize down time.

6.8. Spot Mirror Assembly

35A-59430 Spot Mirror and Bracket Assembly is intended to provide a visual verification of landing gear position. It is designed to install on an inspection panel under the aircraft wings, both port and starboard.

Figure 6.8.1.

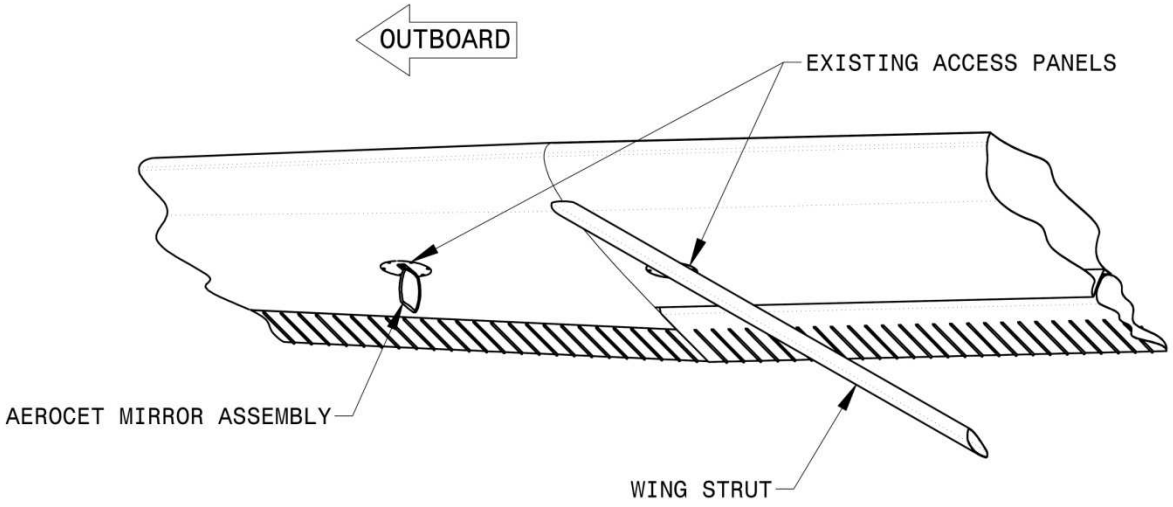
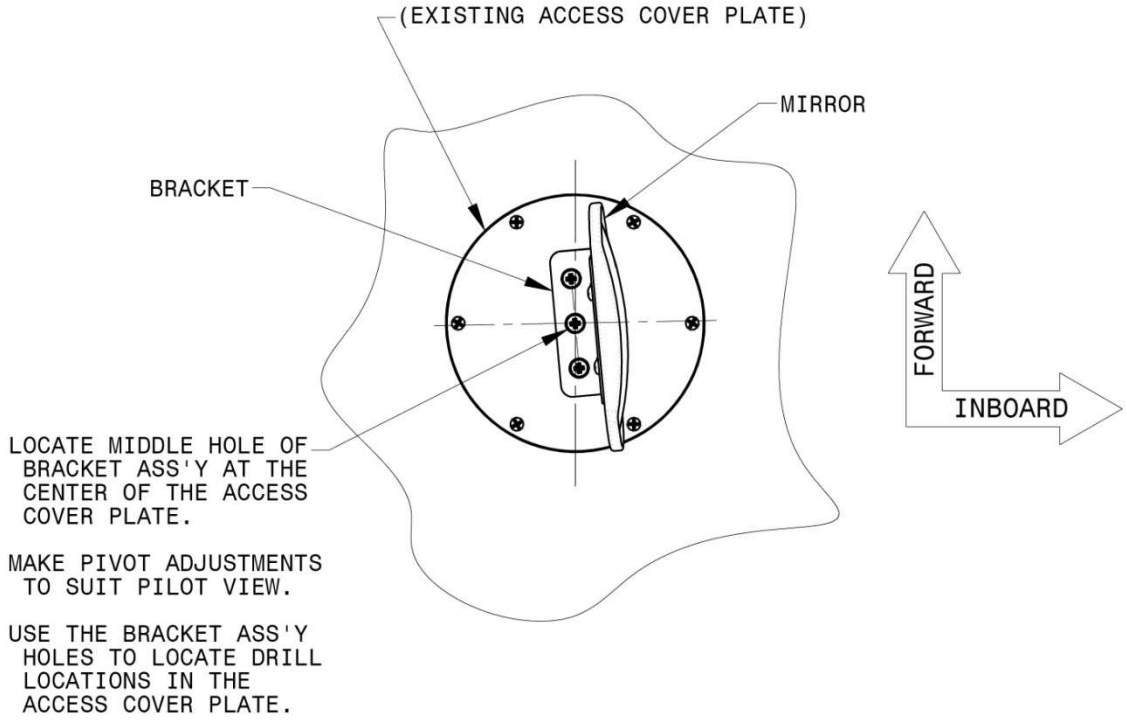


Figure 6.8.2.


(EXISTING ACCESS COVER PLATE)
MIRROR
BRACKET
FORWARD
INBOARD
LOCATE MIDDLE HOLE OF BRACKET ASS'Y AT THE CENTER OF THE ACCESS COVER PLATE.
MAKE PIVOT ADJUSTMENTS TO SUIT PILOT VIEW.
USE THE BRACKET ASS'Y HOLES TO LOCATE DRILL LOCATIONS IN THE ACCESS COVER PLATE.

1. Installation (Ref Drawing No. 35A-59402 and Figures 6.8.1 & 6.8.2)
    a. Locate an inspection cover on the underside of the wing just inboard or outboard of the wing strut. Position the Mirror Bracket so the middle hole is approximately centered in the access cover, and temporarily affix the mirror assembly to it.
    b. Once a good access panel is selected, remove it and drill a #11 (Ø.191) hole in the center. (This will serve as a pivot point for finalizing the installation.)
    c. Loosely assemble the Mirror Bracket and Inspection Cover with Machine Screw, Washer and Nut. (Do not tighten fully, so that it can be rotated to finalize orientation.)
    d. While seated in the Pilot's and/or Co-Pilot's seats, instruct an assistant to pivot and adjust the Mirror Assembly to suit proper viewing of the Nose and Main Gear assemblies. It may be necessary to bend the bracket for optimum view.
    e. Mark bracket hole pattern for remaining two screw holes and remove the cover from the underside of the wing.
    f. Drill the newly marked holes. (You may wish to use the bracket as a guide.)
    g. Install the remaining fasteners.
    h. Reinstall the access cover using the existing aircraft hardware and instructions.
    i. Repeat process for the other wing.

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7 Water Rudder Retraction and Steering System

7.1. General Description

The water rudders are used for steering when taxiing on the water. They are steered through 3/32" stainless cables that connect to the airplanes rudder system and are retracted manually through a lever in the cockpit again using 3/32" stainless cables. They should always be retracted before take off and never deployed until off the step. Damage may result if a take off or landing is attempted with the rudders down. Typically this damages the blade and the stainless tiller post. Internal sealed tubing in which the 3/32" cable passes through, prohibits water transfer between the two rear water tight compartments in each float.

7.2. Rudder Assembly and Internal Cable Tubing - Reference 35-CPL-24001, Sheets 1-3 and appropriate STC installation drawings.

1. Assemble and disassemble water rudders according to drawings.
2. Assure that water rudders are free in movement and rudder links and springs don't have excessive wear.
3. Any hardware that passes through the rear bulkhead should be sealed with a one part urethane sealant.
4. Regarding the internal cable tubing, look for any breaks or wear points (especially where the retract cable comes out the inside of the float) and replace as necessary.

7.3. Rudder Pulleys - Reference 35-CPL-24001, Sheets 1-3.

1. Check freedom of pulleys in all locations. Remove and clean if there is any buildup in the bushing to pulley interface.
2. Remove any pulleys that have wear flats from lack of rotation.

7.4. Rudder Rigging - Reference 35-CPL-24001, Sheets 1-3 and appropriate STC drawings.

1. The rudder steering rigging should align the rudders straight ahead with the airplane rudder centered. Cables should be just taught. There should be no pre-stretching of the springs, which connect them to the airplane rudder system. This keeps the friction low, not hampering yaw stability.
2. The rudder retract cables should be rigged so that the rudders are close to the stops when retracted and that the cables are just becoming slack in the down position.
3. All cables should be examined for deterioration especially around the pulleys at the stern of the float.

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8 Float Installation and Removal to Aircraft

The appendices are intended to provide aircraft specific installation drawings or instructions necessary to install Aerocet Model 3400 Amphibious Floats. Some approvals (by way of Supplemental STC, or via field approval ("Form 337") are not the property of Aerocet and may require other documentation. Supplemental Airplane Flight Manuals (SAFM's), or Airplane Flight Manual Supplements (AFMS's), STC documentation, or other necessary information is not included in this section. It is the responsibility of the Installer and the Owner(s) and the Pilot to ensure that the modification is accomplished and documented in a correct manner.

Float service and maintenance is dealt with in previous sections of this manual, supplemented by the Customer Parts List (CPL), 3400 CPL.

8.1 Installation Instructions:

For Cessna 180/185 Installation: 35A-59000

For Cessna 206 Installation: 36-15010

These instructions will direct you through the installation drawings which contain requirements for the float installation. Where applicable, hints, advice or relevant specifics are added.

Obtain or locate the applicable drawings and documents listed below and familiarize yourself with the contents. These drawings are FAA approved data. Deviation from them is subject to some other approval process, such as a field approval or an add-on STC. Determination must be made that the installation does not conflict adversely with any previous modifications (See the applicable STC).

Cessna 180, 185 and 206 aircraft require the previous installation of the Cessna "float kit" for that aircraft. This will include, among other things, certain reinforcements such installations as cabin vee brace, anti-corrosion treatments, hoisting rings, and, in the case of the Cessna 206, a ventral fin and larger air rudder. The required parts are listed in applicable Cessna Parts Catalogs and Cessna Floatplane Owner's Manual Supplements.

Aerocet provides float and fuselage fittings, struts, tie rods, gear advisory, wiring, hydraulics and water rudder rigging with all new floats.

Prior to beginning the installation, verify the entire equipment list of the aircraft against installed equipment and obtain a certified weight and balance.

> NOTE It is highly recommended to re-weigh the aircraft, especially if the equipment list has changed or it has been more than two years since a full weighing. Follow the procedures in the Cessna Manuals.

8.1.1 Float Preparation/Spreader and Deck Fitting Installation

For Cessna 180/185 Installation: 35A-59300, 35A-59100

For Cessna 206 Installation: 36-15011

You will need a large, clear work floor.

Uncrate and remove all protective wrapping of the floats and associated boxes containing small parts, hardware, etc. needed to install, noting identifications and keeping things in groups as you go. Certain items are boxed and stowed in the float lockers, while others may be shipped separately.

8.1.2 Before Completion of the Installation:

Apply grease or oil to main gear wheels per applicable component maintenance manual(s). (See Section 1.2) If installing used floats, disassemble, clean, inspect, lubricate and reassemble. It may be

desirable to do this before mounting the aircraft. (Nose Gear wheels are pre-packed. Disassemble, inspect and re-pack if installing a used set of 3400's.)

8.1.3 Float Assembly:

You will need the help of at least four people to align the floats and install the spreaders.

1) The Aerocet floats are shipped with pre-fitted spreaders, which are individually wrapped and packaged for shipping. Please refer to the instructions in the drawings and the following advice to assemble the floats together in preparation for accepting the aircraft.
2) Identify the position and orientation of the spreader bars using the markings centered on the bottom-sides of each. The front (or forward) spreader is marked with an "F" and an arrow shape that indicates the forward orientation. The back (or aft) spreader is marked with a "B" and an arrow shape that also indicates the forward orientation. (See Figure App 1.1) The arrow shape always points forward.
3) As a precaution, is advisable to measure the socket depth (high side is short due to the angle of the float sides) and transfer the measurement to the spreaders, so that you can later confirm your progress during the installation. Do not allow the spreader holes to go past the matching holes in the float decks.

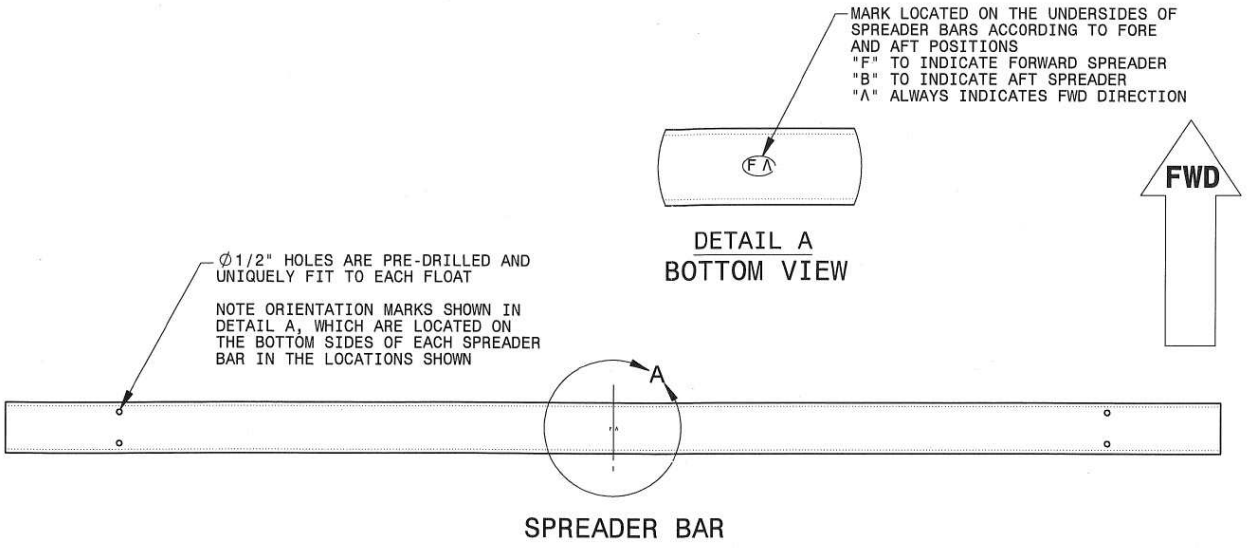

MARK LOCATED ON THE UNDERSIDES OF SPREADER BARS ACCORDING TO FORE AND AFT POSITIONS
"F" TO INDICATE FORWARD SPREADER
"B" TO INDICATE AFT SPREADER
"^" ALWAYS INDICATES FWD DIRECTION
F
FWD
DETAIL A
BOTTOM VIEW
Ø1/2" HOLES ARE PRE-DRILLED AND UNIQUELY FIT TO EACH FLOAT
NOTE ORIENTATION MARKS SHOWN IN DETAIL A, WHICH ARE LOCATED ON THE BOTTOM SIDES OF EACH SPREADER BAR IN THE LOCATIONS SHOWN
A
SPREADER BAR

Figure App 1.1 (Note: this is a Bottom View)

> **WARNING** DO NOT INSERT THE SPREADERS TOO DEEPLY INTO THE SOCKETS OR YOU MAY DAMAGE THE OUTER SKINS OF THE FLOATS.

> **WARNING** DO NOT OVER-TORQUE DECK BOLTS (25FT-LBS.) OR YOU MAY CAUSE DAMAGE TO THE FLOAT STRUCTURES.

4) Assure that all float sockets and spreader ends are free of chips and debris. Apply a thin film of marine grade grease to the sockets and the spreader ends. This amount of grease should be enough to omit adding more through the grease zerks immediately after installation is complete.

> **WARNING** INTRODUCE GREASE VERY SLOWLY AND CAREFULLY, WHEN USING THE GREASE FITTING ON THE SPREADER SOCKETS. OFTEN, INITIAL ASSEMBLY GREASE IS SUFFICIENT FOR YEARS OF SERVICE, SO SPARING USE IS ADVISED TO REDUCE RISK OF CAUSING TOO MUCH PRESSURE OR COMPROMISING THE SEAL.

5) Carefully insert the spreader ends into one float, using a second person to help support the float and/or the spreaders. Align the pre-drilled holes, place the deck fittings as shown in the drawings and install the bolts. It is not necessary to tighten the clamp blocks and nuts at this time.

> **NOTE** ALL PARTS AND HARDWARE THAT PENETRATE FLOAT STRUCTURES ARE INTENDED TO BE SEALED WITH A MARINE GRADE URETHANE ADHESIVE SUCH AS SIKA-FLEX 292 OR 3M 5200. DO NOT USE SILICONE.

6) With the bolts inserted into the one float, level and align the floats across from one another. Two people, one for each spreader and two additional people, for each end of the loose float, will be initially required to stabilize and align everything unless you are otherwise able to secure the floats. Start the spreaders into the opposite float, slowly working them inward in small increments, alternating fore and aft. The spreaders will tighten up as they are inserted more deeply, until is ineffective to continue simply pushing on them.

> **CAUTION** DO NO USE SLEDGES, OR OTHER IMPACTING DEVICES IN AN ATTEMPT TO MOVE THE FLOATS TOGETHER OR APART. THIS MAY RESULT IN DAMAGE TO YOUR FLOATS.

7) At this point, it may be helpful to install a strap or a strong rope to the deck cleats and cinch the floats together incrementally. More force can be applied by twisting the strap from the center. This method creates a great amount of force, so do not insert the spreader too deeply, continually cinching the floats together fore and aft alternately. Monitor the progress by measuring the depth marks made earlier.
8) Once the holes are aligned, place the applicable deck fittings and bolts, and finalizing the bolt torques.
9) Seal the spreader with a fillet of marine grade urethane, such as Sika-Flex 292. Upon its cure, create a small hole in the bead to help relieve internal pressure from later greasing.

8.1.4 Strut and Tie Rod Installation

1) For Cessna 180/185 Installation: 35A-59100, also 35A-60000 for hydraulic lines through the struts
2) For Cessna 206 Installation: 36-15100, also 36-15400 for hydraulic lines through the struts
3) Prepare the aircraft for float installation, assuring that all prerequisite float gear has been installed. See Installation Instructions, above, STC Limitations (if applicable), and Installation Drawings. Use a hoist with plenty of capacity to handle the floats and the weight of the aircraft together.
4) Remove landing gear per Cessna Manuals.
5) As shown in the Installation Drawings, Aerocet intends the use of washers beneath the head of the fastener (preferably a thin washer) and beneath the nut. This helps to isolate the steel of the fasteners from the aluminum of the struts. If necessary, it is permissible to change the thickness of the washers or add up to two washers beneath the nut to avoid bottoming the nut on the bolt shoulder. A properly sized bolt will have less than 2 threads penetrating the assembly hole after tightening. If necessary, use one dash number bolt larger or smaller to obtain the proper grip for the installation. Please refer directly to the drawings for callout details.

NOTE The hydraulic lines will have to be routed through the struts before the airplane is lowered to the struts.

6) Apply corrosion inhibiting compound, such as Puralketone, to all metal fasteners during and after installation.
7) Tie Rods should be generously lubricated with a high quality anti-seize compound to all threads to avoid galling of stainless components. Tighten them evenly, assuring the craft's alignment to like datum points on each wing and each float. Anti-chafing material, such as leather, vinyl or nylon may be affixed where tie rods pass closely. If this is not a first installation, thoroughly inspect the tie rods for corrosion, pits, dents or other damage before using them. Apply a coat of wax or oil to prevent corrosion.

8.1.5 Water Rudder Rigging Installation

For Cessna 180/185 Installation: 35A-59300
For Cessna 206 Installation: 36-15200

1) Aerocet floats are supplied with stainless 3/32" Wire Rope per MIL-DTL-83420, Type I, Composition B, which is to say, non-jacketed, stainless steel. Aerocet supplies stainless, 7 X 7, but allows steel 7 X 7 as well. 7 X 19 is acceptable if preferred.
2) Start cable installation with the water rudder inter-connect or "balance" cable, having someone hold the water rudders aligned to one another. Install the turnbuckle to one side (typically near the left float), with clearance to the float structure at full water rudder deflection. Do not install the turnbuckle in the middle as it will allow greater movement in the cable, possibly against the spreader. There are a number of options to use, please refer to the installation drawings for details.
3) The float cable exit points for the remaining steering and retract cables will have to be located once the aircraft is positioned on the struts. Refer to the installation drawings for locations and instructions. Take time to align these carefully, opening the exit hole if necessary up to 9/16" diameter, securing with cabo-sill/resin mixture or with marine grade urethane adhesive such as Sika-Flex 292.
4) Water Rudder Steering cables are routed per the installation drawings, attaching to the rudder cables. They run aft on the 180/185, and, on the 206, run forward to the rudder pedal extensions (part of the Cessna float kit) that extend below the fuselage.
5) Water Rudder Retract cables route forward, meeting below the fuselage and then attaching to the retract handle assembly in the cockpit. The rudders should be approximately .5" from the upper stops on the tillers when fully retracted, and should come to rest on the lower stops when fully deployed. The best exit angle for this cable through the float will be found at the mid-point of the retraction/deployment positions. Assure clearances to tie rods, or aircraft structures that might protrude nearby. Cable travel or slack should not be able to deflect into such things.

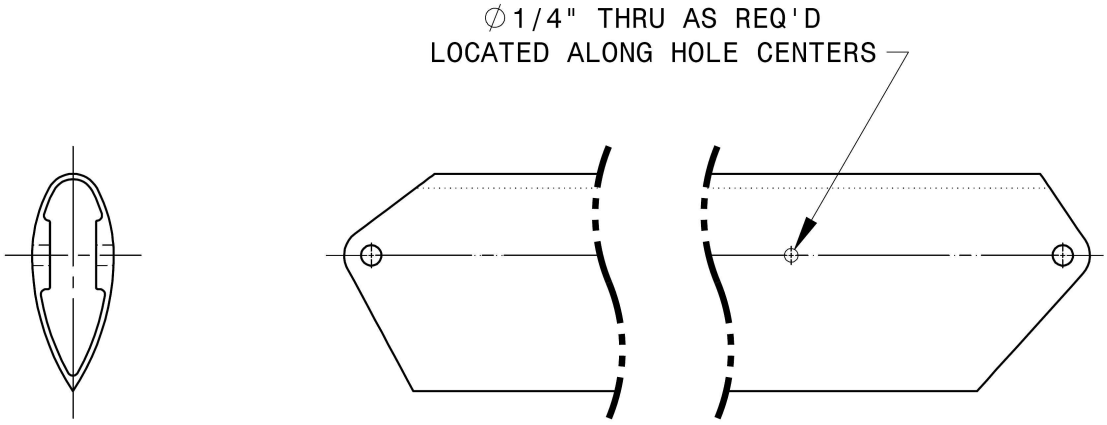
NOTE It is highly advisable to install optional zinc anode to water rudders when used in a marine (salt water/air) environment. Abrade metal surfaces to ensure electrical conductivity to rudder blades using an ohm meter, through cables and bonded to the aircraft. A proper installation will result in the zinc anode's corrosion instead of other expensive aluminum parts.

8.1.6 Boarding Step Installation

For Cessna 180/185 Installation: 35A-59100
For Cessna 206 Installation: 36-15300
Boarding Steps are installed to the outboard sides of the struts as shown in the drawings, creating a ladder for loading and boarding of the aircraft. All installations typically use an "AN4" bolt with a washer

beneath the head and another beneath the nut, and a plastic washer between the boarding step and the strut.

For some struts, pre-drilled holes are provided to mount the steps. The boarding steps are provided with a mounting hole in one end, allowing them to be pinned and leveled to locate and drill the opposite end. Locate new step mounting holes between the strut fitting hole-centers, which are near center of the internal flats of the strut shape. Position the steps at the heights shown in the Installation Drawings or to the existing mounting holes and level them. Drill holes perpendicular to the strut and step surfaces.



8.1.7 Ventral Fin Installation (Cessna 180 or 185 aircraft only)

For Cessna 180/185 Installation: 35A-59030

8.1.8 Aileron Fence Installation

(Cessna 206 aircraft only, Disregard installation if original equipment for later model aircraft; or through Wipair float installation.)

For Cessna 206 Installation: 36-15500

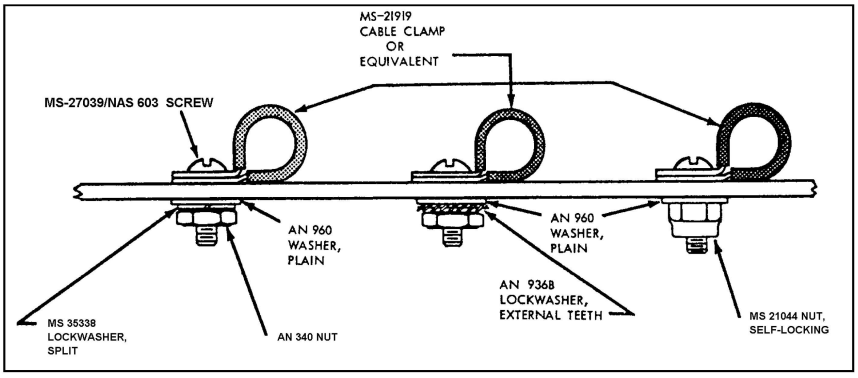
8.1.9 Hydraulic Pump Installation

1) For Cessna 180/185 Installation: 35A-60000, 35A-60001, 35A-60010, 35A-60015, 35A-61000, 35A-62000, 35A-64000
2) For Cessna 206 Installation: 35A-60015, 36-15400, 36-15410, 36-15460, 36-15480, 36-15490
3) This portion of the installation incorporates the in-aircraft hydraulic and electrical components. There is an electric hydraulic pump mounted in the aft of the aircraft, a mechanical hand pump and a gear advisory in the cockpit and the connection systems necessary to operate the float gear.
4) You will need to familiarize yourself with the overall installation before proceeding. The drawings contain necessary details for the proper installation. Assess any difficulties or obstructions prior to beginning this portion of the installation. Using the Cessna Maintenance Manual Procedures, it may be helpful or necessary to create new access holes and covers and plates in certain areas of the floorboard. The locations and quantities of original access holes can vary due to either modifications or to model variations even within the aircraft types.
5) Prepare for and proceed to disconnect aircraft battery according to Cessna Service Manual.
6) The electric hydraulic pump is mounted in the back of the aircraft, aft of any baggage area. For the 180/185 installation, refer to 35A-60000 for details. For the 206 installation refer to 36-15490.
7) The hand pump, used in cases of electrical failure, is mounted between the pilot and copilot. For the 180/185 installation refer to 35A-64000 for details. For the 206 installation refer to 36-15460.

8) Hydraulic line installation and routing is routed from the electric/hydraulic pump forward to the hand pump and down to the floats. For the 180/185 installation, refer to 35A-60000. For the 206 installation, refer to 36-15400.
9) It is good practice to identify gear up (retraction lines), gear down (deployment lines) and return (reservoir lines) to avoid confusion while working on them. If a line is improperly connected, then the system will not function properly. It may run without building pressure in one direction, for instance.
10) Electrical hook up is done to schematic 35A-60015 and detailed in 35A-60000 for the 180/185 or 36-15410 for the 206.
11) Gear Advisory is to be installed in a standard Ø3.25" instrument hole, using #6-32 machine screws. It should be located near-left of the A/C Centerline and within unobstructed reach of the pilot. Refer to Component Maintenance Manual A-10037 for GC600. Also see 35A-60000 for Cessna 180/185. For 206 refer to 36-15410.
12) Circuit breakers are to be installed near existing breakers. Some aircraft may have modified, separate busses for essential equipment or non-essential equipment. In this case, install the 25 Amp breaker, which supplies the electric hydraulic pump, to the non-essential buss. The remaining two 1 Amp breakers should be installed on the essential or primary buss in order to provide gear position indication in the event of an electrical problem in which the pilot would shut down the non-essential buss.

8.1.10 Wire Routing:

1) Assure clearances to all control cables, pulleys, and structural members. Plastic ties must not be used where their failure could result in interference with moveable controls, equipment or chafing damage.
2) Wires routed near hydraulic or fuel lines must be positively separated by 6 inches, or with MS21919WDG(size) clamps.
3) Where wires pass through bulkheads or other structural members, a grommet or suitable clamp should be used to prevent abrasion. (grommets such as MS3489(size) or MS21266(size)) (support such as angle brackets & MS21919WDG(size) clamps).
4) Secure all wiring by using existing wiring where possible. Primary support (such as MS21919DWG clamps) shall be used at intervals not exceeding 21". Replace existing clamps with larger size as necessary. Do not pinch wires. (refer to notes 1 and 6 for secondary support.)

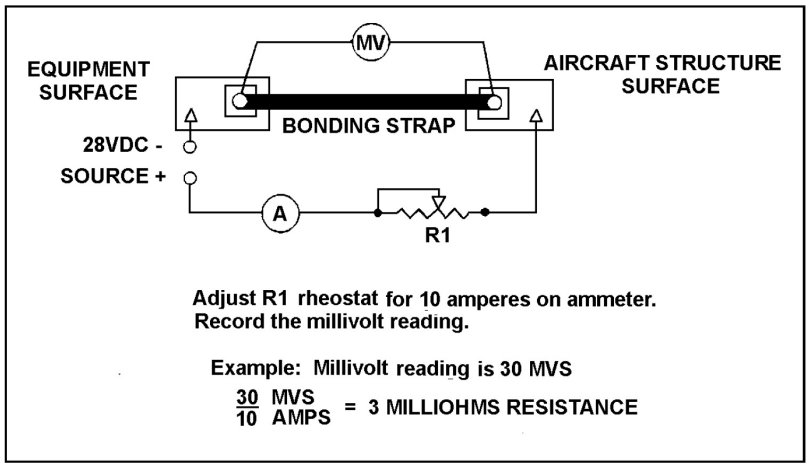


(FROM AC43.13-1B, PAR 11-49)

5) Clamps on wire bundles should not allow the bundle to move through the clamp when a slight axial pull is applied. The cable or wire may be wrapped one or more turns of electrical tape when required to achieve this fit. Leave sufficient slack between the last clamp and the termination to prevent strain or allow any future servicing. Wherever possible, orient clamps with the attachment hardware

positioned above the wire, so that they are unlikely to rotate as the result of wire bundle weight, or wire bundle chafing.

6) Nylon ties (such as MS3367-4-9 or equivalent) or approved lacing may be used at intervals of 12" to 18" to provide secondary support, or grouping. (for lacing practices, please refer to AC43.13-1b, par158.)
7) Non-adhesives tapes may be used for protection so long as drainage is provided to avoid moisture entrapment. (may require additional means of securing such as nylon ties.) Adhesive tapes shall not be used except per note 5.
8) Permanently identify wires using codes shown in Dwg. No. 35A-60015 (schematic) within 3" to 6" of each termination. It is recommended that additional permanent identification be applied at approximately 15" intervals, and in practical and suitable areas where maintenance may be anticipated.
9) Grounds: Use existing ground stud where applicable, or as specified, to aircraft structures. Do not exceed 3 terminations. Ensure that system types (AC, DC, Static) are not mixed. Prepare surface(s) by removing any paint, debris, corrosion or surface treatments to ensure a clean bond. Resistance shall not exceed .0025Ω to aircraft structures. Keep wire length less than 6 inches.



(FROM AC43.13-1B, PAR 11-188)

8.1.11 Checklist

Note: Check all work before proceeding. (minimum checklist)

1) Torque for all bolts: (See Tables in Section 2.2 – Except where otherwise noted)
2) Spreaders and Deck Fittings – 25 ft-lbs. to self-locking nuts on AN8 Bolts.
3) Fuselage and Strut attachments.
4) Water Rudder Rigging – all attachments, pulleys and retract handle.
5) Hydraulic and electrical fittings and hardware. (leave access points open for troubleshooting and leakage checks)
6) Check for proper installation of any cotter pins and safety wire.
7) Ensure that the aircraft and the floats have been closely squared to one another. (See Strut and Tie Rod Installation) Adjust Tie Rods as necessary.
8) Check all exposed hardware for application of anti-corrosion compounds.
9) Check all grounds and electrical routing.
10) Check aircraft battery condition. (Insufficient power or reserve will produce unpredictable results during gear checks)

11) Check the fluid level in the Electric Hydraulic Pump – should have no less than 1 inch of fluid in the sight glass, but may be fully filled at initial start as the system will use some of that.
12) Check wheel assemblies for lubricant.
13) "Bleed" or purge all air from brake lines. (Pedal fade after much bleeding may indicate a leak or a worn master cylinder.)
14) Re-connect aircraft battery according to Cessna Service Manual.

8.1.12 System Activation

1) With the aircraft and floats securely hoisted or lifted and all precautions taken to prevent an engine start:
2) Note the position of the float gear and place the Gear Position switch to match.
3) Activate the Master Switch.
4) Note any audio enunciations. Push "TEST" button on gear advisory to verify audio enunciation. (Announcement verbiage may vary at this point, due to unknown or moving gear positions. See A-10037 for GC600.)
5) Let the pump run until it cycles fully in one direction – unless it keeps running or empties the reservoir. (See Troubleshooting, check for leaks, or re-fill reservoir.)
6) Turn Master Switch to "OFF".
7) Check the fluid level in the hydraulic pump reservoir, fill as necessary.
8) Repeat in the same manner and gear direction until the gear reach full extent of this cycle, pressurize and the pump shuts off independently.
9) Repeat the above sequence in the opposite gear direction, refilling pump as necessary.
10) Cycle the gear in both directions, to ensure that all air is purged throughout the system, that the gear transition smoothly in both directions, that the pump stops at the full extents and that the Gear Advisory shows the proper light indications. Audio should activate upon all lights being activated. (See A-10037 for troubleshooting of GC600 Gear Advisories)
11) Turn Master Switch to "OFF".
12) Replace all access covers in the aircraft and the floats.
13) Install all pump-out plugs. Optional: Secure pump-out plugs to floats using weather resistant line attached to access panel screws on the undersides of access panel.

8.2 Conversion from Floats to Wheels

1) Hoist and secure aircraft using lifting rings installed with the Cessna float kit and other tie down rings as necessary.
2) Assure that float gear are in fully deployed condition, with all lights appearing on the gear advisory.
3) Turn Master Switch "OFF".
4) Pull one amp breakers for the gear advisory, pump relays and the twenty-five amp breaker for the electric hydraulic pump.
5) Disconnect aircraft from power sources and battery – first assuring the proper shut down of all other aircraft equipment per Cessna or other applicable service manuals.
6) Disconnect water rudder control cables from springs, and remove springs and pedal extensions (Cessna 206), or rudder centering device (Cessna 180/185).
7) Disconnect water rudder retraction cables from the aircraft.
8) Loosen boarding steps as necessary. (The boarding steps can be left on if they allow the floats to come off the fittings.)
9) Assuring that power is off (battery is disconnected) so that the hydraulic pump does not function, cycle the selector on the emergency gear hand pump to relieve any residual system pressure. Drain

hydraulic fluid from deploy and retract lines below each float deck into a suitable container for proper disposal. It may be suitable to use the hand pump to drain residual fluid from each side manually.

10) Disconnect all hydraulic lines from the fuselage near the aft strut fitting. Internal hydraulic lines may be left in place if it is determined that no adverse conditions or conflicts exist. Cap ends of all fittings no longer used.
11) Cessna 206: Remove brake line (36-15442 or 36-15443) beneath aircraft floor near the main gear fittings between the fuselage skin and existing bulkhead fitting. Temporarily cap the existing bulkhead fitting to prevent fluid loss or contamination until brake line for land plane gear or wheel-skis is installed. Float brake fitting at aircraft skin may be capped and left in place if no adverse conditions or conflicts are determined to exist.
12) Cessna 206: Remove nose gear cover panels (part of the Cessna float kit) to gain access to front strut fittings beneath the aircraft engine.
13) Disconnect conductor cables, remove terminations and remove from the fuselage and struts.
14) Disconnect and remove the tie rods.
15) Hydraulic lines and electrical wiring should either be removed from the struts entirely or at least disconnected to avoid damage. Lower the aircraft with the hoist until the floats are just resting on the ground. Try to raise and lower the hoist as needed to take the load off of the fittings to remove the bolts. In any case, take precautions to provide support as you free things from the aircraft to prevent unnecessary damage to the struts, floats or hydraulic tubes.
16) Cessna 180 or 185: Take the load off of the aft struts by adjusting the hoist and rocking the rear fuselage. Disconnect the aft struts at the floats, carefully allowing the main gear of the floats to reach the floor.
17) Cessna 206: Take the load off of the front struts by adjusting the hoist and rocking the aircraft. Disconnect the front struts at the deck fitting, carefully allowing the nose gear of the floats to reach the floor. The front struts will hinge inward when disconnected from the floats, someone should hold on to each to keep them from being damaged by swinging freely. Secure as necessary.
18) Disconnect the mid and aft struts at the aircraft fittings, hydraulic lines as applicable.
19) Disconnect the remaining struts for complete disassembly, with the floats sitting on the floor.
20) Cap the hydraulic fittings (three on each float). Clean excess fluid from the floats as soon as practical to avoid staining the gelcoat.
21) As applicable: Cap any unused hydraulic fitting left in the fuselage.
22) Install landing gear per Cessna manuals and instructions, refill brake master cylinder and bleed the brakes.
23) Winter storage, where temperatures may drop below freezing, is addressed by adding a quart of RV antifreeze through each of the pump-out cups. Taping over the pump-out holes will minimize the amount of moisture that will enter each of the six compartments. Do not use masking tape.
24) The floats may be stored on the wheels, resting on the keels, or hung from a sling around the floats near the spreader bars.

8.3 Weight and Balance

The most accurate means to determine the weight and balance of a modified aircraft is by physical measurement.

> CAUTION: Aerocet highly recommends that the aircraft be weighed to determine the weight and balance of the 3400 modified aircraft. An inaccurate CG may lead to exceeding the CG range resulting in inadequate control.

Modify the equipment list to include the 3400 float installation and verify the remaining items. On level scales with each wheel on the scales aircraft empty – no fuel.

Scale	Measured Weight	180/185 Arm	206 Arm	Moment, W*Arm
Front Left scale		-60.8	-60.2	
Front Right Scale		-60.8	-60.2	
Rear Left Scale		61.4	62.4	
Rear Right Scale		61.4	62.4	
Tare weights (chocks)				
Tare weights (chocks)				
Total Weight & Moment				
Total Arm (divide moment by weight, M/W)				

If weighing the aircraft is not practical, use the following data

Item	Weight (lb.)	180/185 Arm	206 Arm	Moment, W*Arm
Certified Empty Weight as currently equipped (verify the equipment list)				+
Main gear (800 x6 Cleveland -Typical)	-121 (206) -120 (180/185)	18.0	63.1	-
Nose gear or Tail gear (8” less stinger)	-41 (206) -10 (180/185)	260	-0.68	+
3400 Float installation including all installed equipment	651 (180/185) 663 (206)	44.1	42.8	+
New Empty Weight (Total)				
Total Arm (divide moment by weight, M/W)				

8.3.1 Weights for components left installed

For temporary float removals, such as for winter flight on skis, it may be desirable to leave certain float equipment on board, such as hydraulic lines and fittings, float gear wiring and hydraulic pumps. The following table shows weight and balance data for typical equipment. Equipment not listed must be weighed separately.

Item	Weight 185	Weight 206	Cessna 180 or 185 Location	Cessna 206 Location
Electric Hydraulic Pump (w/hardware)	10.0 lbs.	9.0	167.50	163.0
Hand Pump (w/hardware)	3.2	2.64 (incl. hyd. Fittgs. To floor)	31.38	30.63
36-15434-1 (w/rivets)	N/A	.125	N/A	31.18
36-15434-2 (w/rivets)	N/A	.125	N/A	39.10
35-24010	.60	N/A	22.26	N/A
35-24011 (Excl. rivnuts or nutplates)	N/A	.50	N/A	41.30
Hyd Lines to pump	2.5	2.5	95	97.5
Ventral fin	2	4.5		214
GC600 Gear Advisory	1.70	1.70	14.5	15.9

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9 Repairing Composite Float Hulls

9.1 General Description

Composite float repair, done correctly, will obtain the strength required to put the float back into service and cosmetically show little or no evidence of damage having ever taken place. The materials used for original construction and repair, are conventional to the industry. Any damage on the bottom of the float should be repaired immediately because of the tremendous water pressures encountered. Contact Aerocet, Inc. prior to beginning a repair to obtain correct materials - resin (resins have shelf lives), catalyst, cloth, gel-coat, resin thickeners. Epoxy underwater patch kits may be used in an emergency if the damage is relatively small, but the repair must be replaced with correct materials for equal strength status. Damage larger than 4" in size require consulting Aerocet, Inc. for proper laminate orientation and assuring number of laminates in the damaged area.

9.2 Repair Types and Procedures

All repaired areas on the exterior must be surface coated (gel-coated) with a minimum of 10 mil thickness to assure UV protection.

A. **Resin Starved Areas, Exposed Fibers, or Small Impact Damaged Soft Spots (1/2" Dia. or less)**

1) If necessary sand surfaces to remove gloss.
2) Use brush, squeegee, or hypodermic to work resin into defective area. (use same resin as the original laminate)

B. **Small Bruises, Punctures Less than 1/4" diameter, or Surface Voids.**

1) Sand surface surrounding defect to remove gloss.
2) Use same fabric as the original part.
3) Cut patches to fit correction area, extending a minimum of 1/2" past the damaged area. All patch corners must be rounded.
4) Apply a light brush coat of resin (similar to original).
5) Place one or more plies on detail covering correction area using impregnation of fabric as described in section 8.3.

C. **Cuts, Fractures, or Punctures 1/4" diameter or Larger.**

1) Cut back material as required to ascertain extent of damage. Trim back plies to a smooth oval (1/2"per ply generally).
2) If the area is large enough supply backing to hold the shape of the original contour. Put a parting agent on this backing to assure its release.
3) Replace the fabric on a ply for ply basis overlapping 1/2" minimum on each succeeding ply using impregnation of fabric as described in section 8.3.(Any smooth areas need to be sanded with 80 grit sandpaper to assure proper bonding)

4) If damage has occurred where there is sandwich construction involving the core, work each layer separately. Fix either the outside or inside skins. Then cut to fit like core material to replace the damaged core. Bond the core onto the repaired skin using the proper resin and thickener. A mixture of Hydrex resin and Aerosil 202 thickener should be applied to the bonding surface of the core using a squeegee (Torin Corebond alt. OK). A film of approximately .015" should be used. Pressure needs to be applied for the bond to assure proper adhesion to the skin eliminating air voids. This pressure can be applied to small area core bonding by weights (ex. lead shot bags with a release film to keep from sticking to any excess). Larger areas require core bonding using a vacuum bag. Consult Aerocet, Inc. for this procedure. Fill any seam voids with a resin/glass bubble mixture. Apply the final laminates accordingly to finish the repair.

9.3 Impregnation of Fabric

Resin impregnation can be accomplished by laying cloth, cut to a suitable pattern, on a flat table and applying resin mixture with a squeegee so as to achieve an even impregnation. It may also be done similarly directly on the part with the cloth is being applied using either a squeegee or brush providing voids and starved areas are not produced. It is very helpful to apply a thin coat of resin to the area to be laminated. Then lay the cloth down, rolling the cloth into the resin. Any air in the laminate should be squeegeed or brushed out. See section 8.4 regarding resin mixing.

9.4 Resin Mixing

Gel times or pot life is the time it takes the resin to set up in the container after proper and thorough mixing with accelerators and catalysts. Gel times can be adjusted significantly by varying the amounts of these materials. Gel times also will vary significantly with the batch size if left in a bucket or with a very thick laminate.

TYPICAL GEL TIMES (HYDREX 33-253) 100gm castings only, laminate times typically double

33%MEKP %Catalyst	Resin Qty	50°F	60°F	70°F	80°F
.75%	100gm	55 min	38 min	28 min	23 min
1.00%	100gm	40 min	27 min	20 min	15 min
1.50%	100gm	30 min	21 min	14 min	11 min
2.00%	100gm	23 min	17 min	12 min	8 min

Note: *Under no circumstances* should more than 2.0% catalyst mixture be used. Also, do not use less than the recommended minimum amount of catalyst (.75%) or the resin may never completely cure, resulting in a reduction of strength.

WARNING: Be careful with the MEKP catalyst. Contact with eyes must be prevented. Blindness may result. Flush eyes immediately, contact a physician immediately. Never mix MEKP catalyst into the resin without eye protection.

9.5 Preparation of Fiberglass Materials

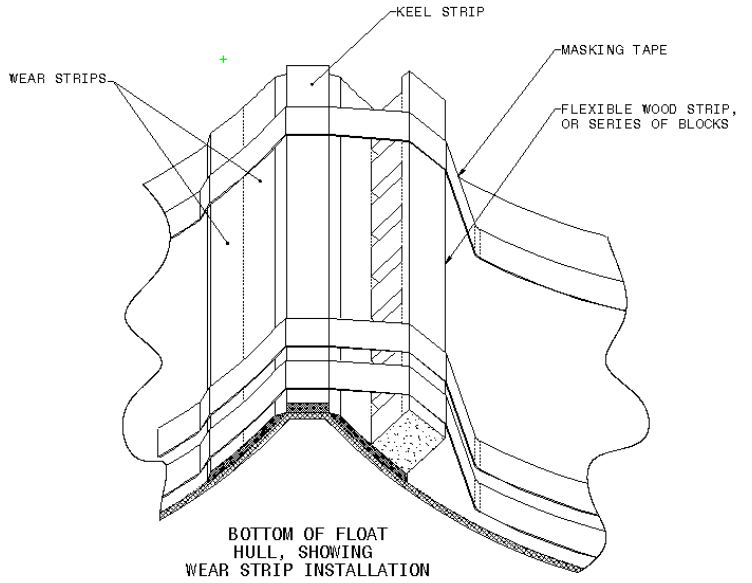
Fiberglass shall be trimmed on a clean table to prevent contamination.
When laps are necessary, lap widths of at least 1/2" shall be maintained for fiberglass pieces in any given ply and no more than one of the component plies shall be lapped at any one place. The number of laps shall be kept to a minimum.

9.6 Surface Coat Application (Gel Coat)

All surface coats must be applied to a thickness of 10 to 15 mil. Use a mil gauge and check often.
Waterline down is very critical to prevent blistering from water absorption.
All surface coats must be catalyzed with 2% MEKP.
Thinning of surface coats can only be done to manufacturers recommendations

9.7 Keel & Wear Strip Bonding (UHMW plastic style)

*UHMW Style keel and wear strips are no longer offered on new Aerocet floats, being replaced with aluminum keel strips and fiberglass wear strips. These instructions are still applicable to re-bond existing strips, otherwise, contact Aerocet to order replacements of the new styles.
Keel strips are bonded and/or fastened to the keel of the floats in areas the typically receive abuse from rocks, debris and beaching. Keel strips are not optional.
Wear strips are bonded along either side for the same reasons, but do not normally require replacement as often. Wear strips are “optional”, but Aerocet installs them standard with every float, and strongly recommends them.
UHMW strips do age with UV and environmental exposure, resulting in discoloration and cracking.
Prepare keel by sanding surface with 80 grit paper
Bond keel & wear strips on using a mixture of Hydrex resin and Aerosil 202 thickener. A thick epoxy resin (clear type – non yellow) may be used as well.
Saturate the fiberglass backing on the keel or wear strip and put a thick film on the mating surface.
Hold the keel strip in place using an abundance of masking tape. Remove tape before the resin cures to a totally hard condition allowing clean up of excess material to be achieved with greater ease.
Wear strips are more difficult to hold in place during cure with the floats on the airplane. This can be achieved using tape and small lengths of wood to create leverage. See diagram below.



9.8 Keel Strip Replacement (Aluminum Style)

Remove any existing, worn or damaged keel strip. Use a thin metal scraper or similar device beneath the strip to avoid peeling off excessive gelcoat or resin. Older UHMW will likely have deteriorated over time due to UV and environmental exposure, so it may not peel, but will come off in chips instead.
For UHMW style removal: Use 80 grit (or similar) sandpaper to remove original bonding resin. (This should be a white-ish colored hard substance. Coloration may vary if repair has been done before.) There is a woven backing that serves to bond the strip, and this should be removed if it remains bonded to the float. Continue to sand until reaching a smooth, uniform surface in the affected area. Avoid sanding through the gelcoat if possible. If you do sand through the fiberglass, then follow the repair procedures outlined above to maintain original strength.
For aluminum style removal: Remove Sika-Flex with a knife, as needed to obtain a flat and clean bonding area. Some sanding may also be helpful.
Thoroughly clean the affected areas of the keel with acetone.
Temporarily position the keel strip(s) in place, using them as a template to mark drill points. Masking tape may be helpful here.
Drill #24 (Ø.1520) holes perpendicular to the keel, about 1/4" deep. This will penetrate through the shell laminates and begin to enter the keel stringer, allowing the screw to thread in directly. Do not oversize the holes.
Check the fit of the holes' position and screws' ability to be secured. (The next two steps are time dependent and it would be a bad time to discover a problem.)
Thoroughly clean the keel strips, and apply Sika-Primer per manufacturer's instructions.
Apply a bead of Sika-Flex 292 to the keel strip and fit it to the float. Install the screws and use masking tape as necessary to apply pressure and hold it in place during cure.
Immediately clean Sika-Flex from any work areas or unintended float surfaces using acetone, but leave "squeeze-out" adjacent to the keel until cured. (Usually cure is about 12 hrs.)
After cure, use a knife to slice the squeeze-out along the edges of the keel, peeling the bead away as you go. Avoid cutting into the gel coat.

9.9 Wear Strip Replacement:

UHMW wear strips: Remove using a thin, metal scraper or similar device. Older UHMW will likely have deteriorated over time due to UV and environmental exposure, so it may not peel, but will come off in chips instead.

There is a woven backing that serves to bond the strip, and this should also be removed if it remains bonded to the float.
Fiberglass Wear strips: Removal of fiberglass wear strips will require a large amount of sanding, or of careful grinding. Do not penetrate the gel coat on the float hull itself, if possible. If you penetrate the fiber glass laminate, then follow the repair procedures above.
Small repairs to the fiberglass wear strips may also be made using the same repair procedures listed above.
Bonding of new wear strips: Use a resin cabosil mixture, applied to the mating face of the strip(s) and affix them to the float using a similar procedure as detailed in 8.7.4 and .5. A small amount of gel coat will whiten the mixture and help blend the appearance at the edges. If preferred, use Sika-Flex 292 or equivalent urethane adhesive for bonding.

Note: Remove excess cabosil squeeze-out before it fully hardens.

9.10 Chine Rub Strip Replacement:

Chine rub strips are aluminum extrusions that are fitted to the outside edges of the float bottoms. These are necessary to prevent damage to floats in certain docking, beaching or other practices. On the model 3400 floats, there are two shapes used to accommodate the forebody (forward of the step) and the afterbody (aft of the step). These rarely require replacement in most cases and partial replacement may be a good option as well.
Chine rub strips are bonded to the floats with Sika-flex 292 adhesive. Removal may be accomplished by carefully slicing the adhesive and/or peeling the pieces.
Some fitting will be necessary to match any existing abutting pieces. (Most of this is best accomplished with the float being upside down and stably supported on saw-horses.) Work from the step area first as this is the most detailed, trimming the fore and aft ends once things are ready to bond. Firmly secure any fitted, but un-bonded pieces with masking tape to help you accurately arrange and finalize the trimming. Remove any sharp edges to avoid injury.
With all strips firmly taped to the float, mask the float along the edges of the strips. Then remove the rub strips and set them aside. Prepare the bonding area of the floats, sanding as closely as possible to the masking without sanding beyond it.
Thoroughly clean and prime the bonding areas of the float and the prepared rub strips.
Apply a generous bead of Sika-Flex 292 (or equivalent urethane adhesive) to the rub strips.
Position the rub strips and firmly push them onto the floats so that there is a consistent bead of squeeze-out. Aerocet uses a three foot 2" x 2" with a ½" 90 degree notch near the middle to apply heavy pressure with a rocking motion to work out any air pockets in the adhesive. A second person should follow closely, applying strips of 2" masking tape firmly to the float as you work your way down the length of the strips.
Immediately clean Sika-Flex from any work areas or unintended float surfaces using acetone, but leave "squeeze-out" adjacent to the keel until cured. (Usually cure is about 12 hrs.)
After cure, use a knife to slice the squeeze-out along the edges of the keel, peeling the bead away as you go. Avoid cutting into the gel coat.

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10 Recommended Service Schedule, General Practices and Product Listings for Service

TABLE 1

INSPECTION TIME INTERVALS			HOURS (MONTHS) (Whichever occurs first)			
		Notes	25	50	100 (12)	200 (24)
Nose Landing Gear	Nose Gear Tracks	Inspect, clean and re-lube daily (note #1)		X		
	Nose Gear Bottom Block	Lubricate. Do not lubricate without reading warning (note #2)		X		
	Nose Wheel Bearings	Inspect, re-lube bearings & seals prior to assembly			X	
	Nose Wheel Seals	Spray lubricant, LPS-2, on seals where they contact the tensioner bushings	X			
	Nose Wheel Fiberglass Spring	Inspect for cracks, delamination, paint			X	
	Nose Gear Aluminum Parts	Inspect for corrosion, damage			X	
	Internal Protection of Nose Gear Box	Apply corrosion spray to box inside front float compartment (note #3)			X	
	Bolts - Hardware	Inspect for corrosion, apply corrosion protection (note #4)			X	
	Nose Gear Lock & Slide Bushings	Inspect for wear, apply light amount of grease to slide pins through holes in lock			X	
	Seal Around the Nose Gear Box	Inspect for gaps and reseal between box and float front			X	
	Centering Device Check	Assure side to side travel at the axle is within limits and vertical travel is also within limits				X

INSPECTION TIME INTERVALS			**HOURS (MONTHS) (Whichever occurs first)**			
		Notes	25	50	100 (12)	200 (24)
Nose Landing Gear, (Cont'd)	Perform Retraction Test	Inspect travel & extra side play in deployed position, also perform emergency gear extension & retraction test				X
Main Landing Gear	Main Gear Aluminum Parts	Inspect for corrosion, damage			X	
	Main Wheel Bearings	Inspect, re-lube bearings & seals prior to assembly			X	
	Main Wheel Seals	Spray lubricant, LPS-2, on seals where they contact the tensioner bushings	X			
	Brake Assemblies	Inspect for wear, leakage, corrosion		X		
	Cleanliness	Keep debris from building up, especially on the drag brace stop to assure overcenter operation & rock deflector		X		
	Axle Seals	Inspect O-rings on tensioner bushings			X	
	Bolts - Hardware	Inspect for corrosion, apply corrosion protection (note #4)			X	
	Water tightness	Inspect for signs of leakage through bolts that fasten brackets on & seals on main gear actuator attach			X	
	I-Glide Bushings	Inspect for wear: (obliqueness/cracks/etc.)				X
	Extension Springs	Assure they are in place without breaks			X	
	Composite Gear Box	Inspect for cracks, damage			X	
	Oleo Strut	Inspect for leakage, damage, pressure			X	

INSPECTION TIME INTERVALS			HOURS (MONTHS) (Whichever occurs first)			
		Notes	25	50	100 (12)	200 (24)
	Perform Retraction Test	Inspect travel, also perform emergency gear extension & retraction test				X
Retraction System (Fluid)	Hydraulic Fluid Level	Check sight glass - fill to within 1" of top of sight glass with gear down		X		
Retraction System (Fluid), (Cont'd)	Hydraulic Fluid Screen, Contaminates	Clean and inspect screen, Check for moisture & debris				X
	Hydraulic Lines & Fittings	Inspect for leaks, dents, corrosion, contact with airframe, cables, struts				X
	Hydraulic Actuators	Inspect for leakage (fittings, seals), rod straightness, corrosion			X	
Retraction System (Electric)	Pump, Solenoids, Pressure Switches,	Inspect wiring, mounting, loose terminals, general condition			X	
	Position sensors in floats	Inspect wiring, mounting, general condition			X	
	Pump and Indicator Wiring to Gear Advisory	Inspect wiring, mounting, terminal blocks in floats, general condition				X
Water Rudder System	Water Rudders & Tiller Posts	Inspect for damage and freedom of movement (check right after a take-off or landing with the rudders down)	X			
	Cables	Inspect for fraying (especially around the stern pulleys) & cable guards (cotter pins)			X	
	Pulleys and Bushings	Inspect for freedom of rotation & condition of pulleys			X	
	Internal Cable Tubing	Inspect for signs of leakage and wear around the exit for the rudder retract cable			X	

INSPECTION TIME INTERVALS			**HOURS (MONTHS) (Whichever occurs first)**			
		Notes	25	50	100 (12)	200 (24)
Hulls & Struts	Float exterior	Inspect for damage, surface coat (gel coat - UV protection), keel wear strips, chine wear strips	X			
	Float interior	Inspect for evidence of damage from the interior vantage point				X
Hulls & Struts, (Cont'd)	Access Panels & Pump Out System	Inspect seals, cracks in pump out tubes, attachment of pump out tubes, tube routing				X
	Deck Blocks, Deck Plates and Hardware	Spray coat protection according to Note #3, Hardware according to Note #4, If working saltwater protect more frequently			X	
	Struts	Inspect for damage, corrosion				X
	Baggage Compartment	Inspect seals, latches, internal damage from baggage				X
Walk-Wire (if installed)	Float Bow	Inspect for corrosion of all parts, wear, fatigue or fray.	X			
Placards	Cabin Placards	Inspect for placement & legibility				X

Note #1 - If working sand, wash out tracks daily to remove abrasive potential and lubricate with a dry Teflon coating spray.

Note #2 – Nose block grease warning - Introduction of grease through the grease fitting during normal operation should be minimal (**1/2 pump max of a hand grease gun per week**) always watching for hydraulic lock and any damage from grease gun pressure. Introduce grease very slowly.

Note #3 – Spray coat with a migrating corrosion material (ACF-50, Boeshield T9, or Corrosion X).

Note #4 – Coat hardware with PUR-AL-KETONE or LPS 3.

10.1.1 "Exceptional" Inspections:

In a variety of circumstances, it is necessary to perform prompt inspections for damage. Details relating to these investigations are addressed in Section 2, Section 8 of this manual and Table 1 above. It is the responsibility of the pilot to determine the severity of damage, and the flightworthiness of the aircraft in the field. Inspections and repairs are to be performed as necessary and per practices outlined throughout this manual.

A list of possible scenarios includes, but is not limited to the following:

1. Landing completed on grass or other runway surfaces with the wheel gear inoperative or retracted.
2. Harsh landings, on either runway or water.
3. Impact with a submerged object during taxi, take-off or landing on water.
4. Suspected damage incurred during tie-down or mooring. (e.g. damage from wind or wave action)
5. Excessive water during pump-out on pre-flight inspection.

10.2 General Practices

1. Wiring – attachment to terminals, damaged or corroded terminals, melting of insulation, chafing of insulation
2. Metal Parts – check for corrosion, stress cracks or metal distortion, elongation of holes, rivet damage
3. Critical Bolts – check for corrosion (rust), wear, torque
4. Composite Parts – check for stress cracks, gel coat presence (UV protection), punctures
5. I-Glide Bushings – inspect for wear, cracking, obliqueness
6. Nose Wheel Slide Tracks – clean and lubricate with a dry Teflon coating spray

10.3 Product Listings

1. Hydraulic Fluid – Mil-H-5606 (updated Mil-PRF-5606)
2. Teflon Spray – Accupro Dry Lube 0024636, Comet Industries 6P-730A
3. Wheel Bearing and Nose Gear Lock Bracket Grease – Texas Refinery Corp TRC #880 C&C, BG Products HCF # 605 (Parker P/N 219-06300)
4. Wheel seals to tensioner bushings after installed - LPS Industries LPS 2
5. Float Sealant for Bolts and Chine Strip attachment – Sika Manufacturing Sikaflex 292
6. Rust (corrosion) Protection – ACF-50, Corrosion X, Boeing Co. Boeshield T9
7. Bolt Protection - PUR-AL-KETONE, LPS Industries LPS 3, Zip Chemical Co. Zip D-5029NS, EZ Turn Lubricant United-Erie
8. Composite Materials for Hull Repair – Contact Aerocet, Inc. for resin, cloth, gel-coat, resin thickeners

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11 Tire Pressures

NOSE WHEEL TIRE PRESSURE:

70 PSI on 10-3.50, 4-Ply Rated Tires

MAIN WHEEL TIRE PRESSURE:

55 PSI on 6.00-6, 8-Ply Rated Tires. – Gross Weight above 2950 lbs.

40 PSI on 6.00-6, 8-Ply Rated Tires. – Gross Weight 2950 lbs

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12 Troubleshooting

There are a number of troubleshooting instructions given throughout this manual in relevant areas. This section is intended to compile these instructions and additionally provide any additional instructions that have become evident since the original writing.

Table 12.1 Troubleshooting Model 3400 Amphibious Floats

Float Hull Assemblies (Excluding Amphibian Gear)

Detected Problem	Possible Cause	Corrective Action
Water in floats	Missing plug	Install plug.
	Condensation	Pump out float bays.
	Improperly fastened access panel or locker door	Install panel, latch locker door.
	Damaged or missing door seals	Inspect seals, replace as necessary
	Missing Access Panel fasteners	Replace as necessary
	Improperly sealed fasteners	Disassemble, clean, inspect and reinstall with sealant.
	Cracked cable sheathes	Replace as necessary.
	Damaged float hull	Inspect float bays for signs of penetration.
Excessive drift left or right during water taxi operations	Water Rudder rigging is misaligned	Align the float rudders by re-adjusting the steering cables and/or the balance cable.
	Debris caught on floats	Remove debris.
	Damage to one float	Inspect and repair damage.
	Damage to water rudder blade(s)	Locate and replace damaged pieces.
"Howling" noise from one or both floats after take-off	Locker door left open.	Fly the airplane. Land. Latch the doors.
Aircraft is unstable during water operations	Broken structural members	Inspect Struts, Tie Rods, etc. for breaks and for adjustment.
Rudder Pedal feels "stiff"	Mis-aligned steering cables	Correct the alignments of the exit holes through the floats to the aircraft mounted pulleys.
	Over-tightened turnbuckles	Adjust tension.
	Over-tightened internal float fittings	Loosen the fittings and re-snug them by hand.
Reduced water rudder steering	Broken cable	Replace as necessary.
	Debris caught in the tiller	Remove debris.

Table 12.1 Troubleshooting Model 3400 Amphibious Floats

Float Hull Assemblies (Excluding Amphibian Gear)

Detected Problem	Possible Cause	Corrective Action
	Jammed Cable	Check all pulley assemblies for missing keepers and fouled cables.
	Broken rudder retract spring(s) - Rudders do not deploy fully.	Replace as necessary.
Water Rudders do not retract	Cable jammed	Check for fouled cables and debris, especially at tiller.

Table 12.1 Troubleshooting Model 3400 Amphibious Floats (Cont'd)

Hydraulic System

Detected Problem	Possible Cause	Corrective Action
Electric Hydraulic Pump cycles frequently - without pilot input.	Hydraulic system is compromised - pressure switch is activating whenever the trigger pressure is reached.	Check all lines for damage. Replace as necessary.
		Check all fittings for leakage. Torque or replace as necessary.
		Hydraulic Actuators - worn or damaged end cap seals.
		Hydraulic Actuator Pistons for the Nose or Main Gear have a worn or damaged seal. Isolate the Actuator(s), check pressure losses and replace worn parts.
Electric Hydraulic Pump does not run when gear position is selected.	Hydraulic Lock is ocurring in the system.	Cycle the Hand Pump Selector to the UP and DOWN positions, then to the Neutral or OFF position. Retry. (See Placard instructions, SAFM Instructions or Section 6.5 of this Manual.)
	Hydraulic Lock due to drastic temperature or altitude changes	See above for immediate relief. Then, check 35A-60025 Accumulator Tubes for leakage by loosening or removing them from the fitting at the electric Hydraulic Pump. If Hydraulic fluid exits, then there is a leak in the tube assembly. Replace as necessary.
		If no leak is detected, but problem continues periodically, ensure that larger 35A-60025-2 tube assemblies are installed.
	Gear Advisory is not connected properly	Check connector in the back of the unit. Re-connect.
	Electrical Power is insufficient or non-existent to the Hydraulic Pump	Check power source voltages at the aircraft battery, buss bar(s), circuit breakers, relays at the Hydraulic Pump location and the hook-ups to pump leads.
		Check Aircraft electrical grounds. (Ref 35A-60015 for Float Hook-Up.)
		Check all relevant wiring for damage, corrosion or incorrect installation. (Ref 35A-60015 for Float Hook-Up.)

Table 12.1 Troubleshooting Model 3400 Amphibious Floats (Cont'd)

Hydraulic System

Detected Problem	Possible Cause	Corrective Action
	Gear Advisory Unit has failed.	Check 1 Amp circuit breakers. (One is for the Gear Advisory Internal Relays; One is for the Gear Advisory Electronics.)
		If the CB for the Internal Relays is open, then check for faults with installation wiring. This includes corrosion, damaged insulation or improper hook up. (Ref 35A-60015)
		If the CB for the Gear Advisory electronics is blown, then return the Gear Advisory to Aerocet for repair.
		All other Gear Advisory symptoms refer to Section 6.7 of this manual for K-65 Units, or to CMM A-10037 for GC600 Units.
Electric Hydraulic Pump runs perceptibly slower than normal.	Electrical Power is insufficient to the Hydraulic Pump	Check for faults with installation wiring. This includes corrosion, damaged insulation or improper hook up. (Ref 35A-60015)
		Check battery voltage and condition. Refer to aircraft maintenance manual.
		Check voltage at the aircraft buss connection.
		Check voltage at the terminal block near the hydraulic pump.
	Mechanical Obstructions	Check gear and hydraulic systems for mechanical damage, debris or other obstructions. Assure normal freedom of movement throughout the Floats' Nose and Main Gear Assemblies.
Hydraulic Pump stops working before the gear reach full position.	Mechanical Obstructions	Check gear and hydraulic systems for mechanical damage, debris or other obstructions. Assure normal freedom of movement throughout the Floats' Nose and Main Gear Assemblies.
	Pressure Switch malfunctioning	Isolate the malfunctioned switch and replace as necessary.
Slow Gear Operation	Mechanical Obstructions	Check gear and hydraulic systems for mechanical damage, debris or other obstructions. Assure normal freedom of movement throughout the Floats' Nose and Main Gear Assemblies.

Table 12.1 Troubleshooting Model 3400 Amphibious Floats (Cont'd)

Hydraulic System

Detected Problem	Possible Cause	Corrective Action
	Hydraulic Lines are damaged.	Check all lines for damage such as kinks or blockages. Replace lines as necessary.
	Hydraulic Pump screens are obstructed.	Inspect and clean or replace as necessary.
	Hydraulic Pump Motor is worn.	Replace Electric Hydraulic Pump Assembly.
Hydraulic Pump activates but does not move the gear fully into position, and does not shut off.	Hydraulic system is compromised.	Check all lines for damage. Replace as necessary
		Check all fittings for leakage. Torque or replace as necessary.
		Hydraulic Actuators - worn or damaged end cap seals.
		Hydraulic Actuator Pistons for the Nose or Main Gear have a worn or damaged seal. Isolate the Actuator and replace worn parts.
		Internal parts within the Hydraulic Pump are compromised. Replace the Pump.
Hydraulic Pump activates but sounds and works erratically - may eventually reach full position and shut off in some cases.	Air in the hydraulic system.	With the floats suspended, ensure that the Electric Hydraulic Pump reservoir is properly filled. Proceed to activate the pump in one direction only, re-filling the reservoir as necessary. Repeat for opposite direction until all air is purged from system.
Hydraulic Pump activates in the reverse - ex. Selecting Up with the position switch results in Gear deploying.	Hydraulic lines are reversed.	Check installation to appropriate drawings.
	Hydraulic Pump is wired incorrectly.	Check for proper hook up according to 35A-60015 schematic.
	Internal components are compromised.	Return the GC600 unit to Aerocet for repair.
Gear position activates opposite action for one float from the other. (one float's gear goes UP and the other goes DOWN.)	Hydraulics lines are not correctly installed, likely reversed on one float or the other.	Trace the hydraulic lines to the installation drawing applicable to the Aircraft. (Provided with Installation Package available from Aerocet, Inc. or Seaplanes West, Inc. for 182 Aircraft) (See also 35A-60010)

Table 12.1 Troubleshooting Model 3400 Amphibious Floats (Cont'd)

Hydraulic System

Detected Problem	Possible Cause	Corrective Action
Emergency Hand Pump does not move the float gear.	Selector lever is not positioned correctly.	Refer to the SAFM, Operating Instructions Placard for instruction on the proper position of the lever. Select position and retry.
	Air in the hydraulic system.	With the floats suspended, ensure that the Electric Hydraulic Pump reservoir is properly filled. Proceed to activate the pump in one direction only, re-filling the reservoir as necessary. Repeat for opposite direction until all air is purged from system.
Emergency Hand Pump does not move the float gear in the correct direction.	Hydraulic Lines are reversed.	Trace the hydraulic lines to the installation drawing applicable to the Aircraft. (Provided with Installation Package available from Aerocet, Inc. or Seaplanes West, Inc. for 182 Aircraft) (See also 35A-60010)
	Selector lever is installed backward for this aircraft.	Remove the lever and turn it 180 degrees. (Ensure that the label matches the correct selection. If necessary, trim the closed end, flip the orientation and reinstall.)

Table 12.1 Troubleshooting Model 3400 Amphibious Floats (Cont'd)

Electrical

Circuit Breakers

Detected Problem	Possible Cause	Corrective Action
1 amp Circuit Breaker on bus bar opens.	Hook up wiring is compromised. (CB for internal relays only)	Check for faults with installation wiring. This includes corrosion, damaged insulation or improper hook up. (Ref 35A-60015 schematic.)
	Internal components are compromised. (CB for electronics only)	Return the K-65 unit to Aerocet for repair.
25 amp circuit breaker on bus bar opens.	Hook up wiring is compromised.	Check for faults with installation wiring to the Electric Hydraulic Pump. This includes corrosion, damaged insulation or improper hook-up. (Ref 35A-60015 schematic.)
		Electric Hydraulic Pump motor is failing. Replace pump assembly as necessary.

Table 12.1 Troubleshooting Model 3400 Amphibious Floats (Cont'd)

Gear Advisory** (Includes K-65 Models; See A-10037 for additional details applicable to GC600 Models.)

Gear Advisory Indicator Lights

Detected Problem	Possible Cause	Corrective Action
Hydraulic Pump light does not illuminate when the Electric Hydraulic Pump is activated.	DB-25 connector is not fully connected.	Check the DB-25 Connection and firmly re-install as necessary.
	Diodes near the Electric Hydraulic Pump are installed backwards.	Ensure correct orientation of diodes, checking connections per 35A-60015 schematic.
	Diodes are correctly installed, but have malfunctioned.	Isolate the malfunctioned diode(s) and replace as necessary.
	Faulty wiring.	Check for faults with installation wiring to the Electric Hydraulic Pump. This includes corrosion, damaged insulation or improper hook-up. (Ref 35A-60015 schematic.)
	1 Amp fuse is blown.	Check condition of the fuse. Replace as necessary. Continue investigating for faults if blown.
	Internal Gear Advisory Components are compromised.	Return the Gear Advisory Unit to Aerocet, Inc. for Repairs.
Gear Position Lights do not illuminate.	Mechanical Obstructions.	Check gear and hydraulic systems for mechanical damage, debris or other obstructions. Assure normal freedom of movement throughout the Floats' Nose and Main Gear Assemblies.
	Hook-up wiring is compromised.	Check for faults with installation and float wiring. This includes corrosion, damaged insulation or improper hook up. (Ref 35A-60015 schematic.)
	Position Sensors are malfunctioning.	Locate the malfunctioning sensor and replace as necessary.
	Internal Gear Advisory Components are compromised.	Return the Gear Advisory Unit to Aerocet, Inc. for Repairs.
Gear Position Lights remain illuminated.	Mechanical Obstructions.	Check gear and hydraulic systems for mechanical damage, debris or other obstructions. Assure normal freedom of movement throughout the Floats' Nose and Main Gear Assemblies.
	Position Sensors are malfunctioning.	Locate the malfunctioning sensor and replace as necessary.
	Internal Gear Advisory Components are compromised.	Return the Gear Advisory Unit to Aerocet, Inc. for Repairs.

Table 12.1 Troubleshooting Model 3400 Amphibious Floats (Cont'd)

Gear Advisory** (Includes K-65 Models; See A-10037 for additional details applicable to GC600 Models.)

Gear Advisory Audio

Detected Problem	Possible Cause	Corrective Action
Gear Advisory Audio Warning does not activate. (See A-10037 for Model GC600.)	Volume is too low, or audio wiring is incorrectly installed.	Check Aircraft Audio Panel settings and hook up.
	Static or Pitot system is compromised - does not arm or trigger the advisory unit.	Have a qualified technician check the Static and Pitot systems.
	Internal components are compromised.	Return the advisory unit to Aerocet for repair.
	Trigger Speed is not correctly set.	For K-65 units refer to Section 6.7 of this Manual. For GC600 Units, Refer to A-10037 CMM.*
Audio Warning does not activate after a "Go Around"	Airspeed did not exceed the "Arm" speed.	Increase airspeed during the downwind leg of a "Go Around" procedure.
	The "Arm" speed setting is too high.	For K-65 units refer to Section 6.7 of this Manual. For GC600 Units, Refer to A-10037 CMM.*
Audio Warnings continue to activate.	Incorrect Cancel Button is being depressed. (applies to GC600)	Depress the cancel button for the operation. e.g. the upper Cancel Button for cancelling the "Gear is UP…" warning.
Audio Warnings continually reactivate while flying "in the pattern" after depressing the correct cancel button.	Airspeed is too close to "Arm" and "Trigger" speeds.	Maintain slightly higher speeds.
	The "Arm" and "Trigger" speed settings are too high. e.g. the aircraft is hovering near the Arm and Trigger speeds, re-arming the unit and triggering it again during pattern work.	For K-65 units refer to Section 6.7 of this Manual. For GC600 Units, Refer to A-10037 CMM.*
Audio Volume is too low.	Aircraft Panel Adjustments are incorrect or have been inadvertently lowered.	Adjust the panel settings according to the appropriate Maintenance Manual or Pilot Operation Handbook or Flight Manual.
	Aircraft Power is low.	Refer to Aircraft Maintenance Manual to ensure adequate current and power storage.
		Check, recharge or replace the battery.

Table 12.1 Troubleshooting Model 3400 Amphibious Floats (Cont'd)

Gear Advisory** (Includes K-65 Models; See A-10037 for additional details applicable to GC600 Models.)

Gear Advisory Audio

Detected Problem	Possible Cause	Corrective Action
	Factory presets are not desirable.	K-65 Models: Refer to Section 6.7 of this manual to obtain desired settings. GC600 Models: Refer to A-10037 CMM.
Audio Volume is too high.	Aircraft Panel Adjustments are incorrect or have been inadvertently raised.	Adjust the panel settings according to the appropriate Maintenance Manual or Pilot Operation Handbook or Flight Manual.
	Factory presets are not desirable.	K-65 Models: Refer to Section 6.7 of this manual to obtain desired settings. GC600 Models: Refer to A-10037 CMM.
Speech is garbled during normal flight procedures.	Hook up wiring is compromised.	Check for faults with installation wiring. This includes corrosion, damaged insulation or improper hook up. Ref 35A-60015 schematic and maintenance manual.
	Internal components are compromised.	Return the Gear Advisory unit to Aerocet for repair.

13 Airworthiness Limitations

13.1 GENERAL

The Airworthiness Limitations section is FAA approved and specifies inspections and other maintenance required under §§43.16 and 91.403 of the Federal Aviation Regulations unless an alternative program has been FAA approved.

13.2 DESCRIPTION

D. **TIME LIMITED ITEMS.**

None**.**

E. **REQUIRED INSPECTIONS INTERVAL.**

None**.**

F. **Scheduled Maintenance:** for Aerocet recommended Inspection or Replacement are located in Section 9.

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Installation Drawings for Aerocet Model 3400 Amphibious Floats:

The following appendices list the specific drawings included for each aircraft model covered by this ICA. For current versions applicable to your installation, please consult the STC's AML for revision level of the Master Drawing List. The appendices are bound separately.

Appendix A: Cessna 180 or Cessna 185 Per STC SA01257SE

Aerocet Document A-18, Part Application Listing
Weight Affidavit for Cessna 180 or 185 Seaplanes on Aerocet Model 3400 Amphibious Floats
35-24001, [TSO] Rudder Assembly – also in CPL
35A-46010, [TSO] Float Wiring Schematic
35A-31000, Master Drawing List
35-11050, Tie Rod Assembly, (Rear)
35-11051, Tie Rod Assembly, (Forward)
35-24010, Water Rudder Retract Handle Assembly
35A-59000, General Installation, Cessna 180, 185 Aerocet Amphib Floats
35A-59030, Amphibious Model 3400 180/185 Installation, Ventral Fin
35A-59100, Strut, Tie Rod, & Step Installation, Cessna 180, 185 Aerocet 3400 Amphib Floats.
35A-59200, Spreader Bar and Deck Fitting Installation, Cessna 180, 185, Aerocet 3400 Amphib Floats.
35A-59300, Water Rudder Retract Installation/Water Rudder Rigging, Cessna 180, 185, Aerocet 3400 Amphib Floats.
35A-59301, Rudder Cable Attachment Detail, 180/185 STA. 209.
35A-59400, Installation, Convex Spot Mirror
35A-60000, Hydraulic Pump Installation
35A-60001, Wire Assembly,Relay to Terminal Block, Model 3400 Float STC's.
35A-60010, Hydraulic Line Routing
35A-60015, Float Wiring Schematic,Cessna 180, 185/182/206 Aerocet 3400 Amphib Floats
35A-61000, Hand Pump Assembly
35A-61200, Hand Pump Bracket Assembly
35A-62000, Walk Wire Plate Installation
35A-64000, Emergency Hand Pump Installation
K-65 Montana Float Company Gear Advisory (Superseded by Aerocet Model GC600 Gear Advisory)
K-66 Auxiliary Gear Advisory (Not Applicable to Aerocet Model GC600 Gear Advisory)

-End of Cessna 180/185 – 3400 Installation Listings-

Appendix B: Cessna 206 per STC SA01257SE

Aerocet Document A-26, Part Application Listing
Weight Affidavit for Cessna 206 Seaplanes on Aerocet Model 3400 Amphibious Floats
35-24001, [TSO] Rudder Assembly – also in CPL
35A-46010, [TSO] Float Wiring Schematic
36-15000, Master Drawing List, Aerocet Model 3400 Amphibious Float Installation on Cessna 206 Aircraft
35-11052, Tie Rod Assembly
35-24011, Water Rudder Retract Handle
35A-60010 Hydraulic Line Routing
35A-60015 Float Wiring Schematic
35A-62000 Walkwire Plate Installation
36-15010, Installation, Aerocet Model 3400 Floats, Cessna 206 Series Aircraft
36-15011, Spreader and Deck Fitting Installation, Cessna 206, Aerocet 3400 Floats
36-15100, Strut & Flying Wire Installation [Cessna 206 Aircraft]
36-15200, Water Rudder Rigging Installation
36-15300, Boarding Step Installation
36-15400, Hydraulic Pump Installation
36-15410, Electrical Installation
36-15460, Emergency Hand Pump Installation
36-15480, Terminal Block Assembly
36-15490, Hydraulic Pump Mounting
36-15500, Aileron Fence Installation
36-15600, Placards, Aerocet Model 3400 Floats, Cessna 206 Installation

-End of Cessna 206 – 3400 Installation Listings-